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DISRAELI KOBAK, M.D., Editor

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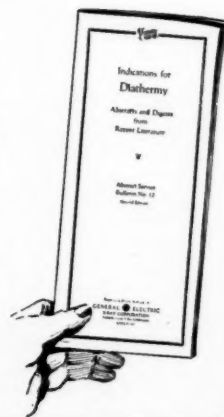
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CHRONIC ARTHRITIS, CLASSIFICATION WITH REFERENCE TO TREATMENT *

N. J. SEYBOLD, M.D.

Physical Therapy Director, St. Vincent's Hospital, Toledo, Ohio

Chronic arthritis has interested physicians for years and will continue to do so. Some years ago Dr. L. T. Barker (*Am. J. M. Sc.*, 147:1, 1914), published an extensive article on the etiological factors of chronic arthritis. In 1909 Nichols and Richardson (*J. M. Research*, 21:149), published an article in which they divided the pathology into two main groups, namely, the proliferative and the degenerative type. To the writer these two terms seem very satisfactory. The first type arises from primary proliferative changes in the synovial membrane and in the perichondrium, resulting in atrophy of the bone and cartilage. The second type arise primarily as degenerative changes in the joint cartilage, resulting in hypertrophy of the joint and cartilage.

In the first type, proliferation of the synovial membrane produces granulation tissue which may extend over the cartilage and destroy it; or the perichondrium proliferation may lead to new cartilage or bone formation. Other periarticular structures may become involved, so that it may lead to joint destruction with subsequent fibrous or bony ankylosis. The cause may be bacterial or toxic in nature.

In the second type, the joint cartilage is primarily degenerated so that it becomes soft and eroded. This exposes the underlying bone, causing two bony surfaces to come in contact. These become very dense with enlargement of the articular heads of the bone. Perichondrial activity may then occur with resultant new cartilage formation, which may be transferred into bone. Lipping and extoses are seen in this form. I realize that this only describes the gross pathology and leaves the question of the underlying pathology in abeyance.

Proliferative arthritis is the same that Goldthwaite calls atrophic. The English writers consider this form as rheumatoid arthritis. Degenerative arthritis is what Goldthwaite names hypertrophic. This form

is called osteoarthritis by some. The proliferative type is usually seen in younger individuals, and the degenerative in older persons. This does not mean, however, that the proliferative cannot occur in older patients. It is generally an infectious affair, the type of "foci of infection" where the sinuses, gall-bladder, prostate, teeth, bowels, tonsils, fallopian tubes, bronchiectasis, and the like, is the exciting cause. This proliferative type comprises the greater percentage of the two forms. The degenerative form is usually non-infectious and occurs with other degenerative changes that attack the aged. This is slow in its advance, as compared with the other, which is progressive and migratory. The proliferative form is polyarticular, while the degenerative is monoarticular. It is more painful and ankylosis is common. With these general findings in mind the proliferative type is divided into: 1, Chronic Infectious; 2, Specific, and 3, Arthritis Deformans. The Degenerative type is divided into: 1, Arthritis of Menopause; 2, Senile Arthritis, and 3, Monoarticular Arthritis.

Chronic infectious arthritis is by far the commonest form met with. It is polyarticular, and any joint may be involved as fingers, knees, wrists, shoulders, etc. It is proliferative and progressive; pain and swelling are common. At first the joint is fibrous, later it may become bony with resultant ankylosis. Streptococci hemolyticus and viridans are frequently found in the teeth or other organs. Mutch and Mutch (*Lancet*, May 14, 1927), when investigating the bacteriology of chronic arthritis found B. Fallax. They were unable to determine whether this germ is a common cause or only an occasional inhabitant of the diseased joint. The effect of a vaccine with this organism was so impressive that it should be added to the common stock vaccines in the treatment of arthritis. Chronic infectious arthritis is migratory in the first stages. The general condition of the patient may be anemic and under-weight. The treatment is as follows: First search for and remove the

* Read at the Eighth Annual Meeting, American Congress of Physical Therapy, Chicago, November 4, 1929

foci; second, use vaccine and protein injections; third, use the various analgesics, orally and intravenously; fourth, use chemotherapy as iron, arsenic, iodides and the like, when indicated, and last, the various physical agencies. To these I will refer later.

Protein therapy is used by many physicians. The types of arthritis responding best to this are the acute and the subacute diseases confined to the periarticular tissues. Improvement is to be had at times when the joints themselves are affected. In some cases this therapy gives no results. Cases of the menopause group and those showing achylia do not respond well. Myocardial damage and gross kidney lesions are contra-indications because the reactions are severe.

Ammonium o-iodoxy benzoate or amiodoxyl has received considerable trial lately. Over twenty-five articles based on the use of this drug have appeared in the last three years. An analysis of these papers shows that 60 per cent report favorable results, while 40 per cent show negative effects. In 1926 (*J. A. M. A.*, September 4, 1926, pp. 741), Young and Youmans first reported the action of this drug in arthritis. Of their 43 cases, at that time, they reported 56 per cent markedly improved, 23 per cent moderately improved, 14 per cent slightly improved and 7 per cent not improved. The following facts are established with this drug. First, that it stimulates leucocytosis and aids antibody formation. Second, that it has a definite bacterioidal action in the blood stream. Third, that it has an intense analgesic effect. Fourth, that it decreases muscle spasm and increases lymph flow. The standard dosage is 1.0 gm. in 100 c.c. of sterile, distilled water, given intravenously by the gravity method, allowing ten to twenty minutes for the procedure. It should be given twice a week, for six or eight doses, then a rest of four weeks before another series is given. Other drugs are to be avoided, especially the salicylates, when using amiodoxyl, as it may increase the severity of the reactions. If the intravenous method is impossible, it can be given orally, but the effect is less marked. The calcium salt should be given in preference to the ammonium, as it produces less gastric irritation—1.5 gm. is divided in three capsules and given on an empty stomach. It is given twice a week.

Vincent Coates and J. L. Delicati (*Lancet*,

May 26, 1928), Studied the effects of liver feeding in infective arthritis in which moderately severe to severe secondary anemia is a constant factor. They divided their cases into two main groups: 1, joint lesions gross; 2, joint lesions less definite. Sixteen cases were observed. They reported improvement in eleven of them. A feature of note is that out of the eleven, seven showed a marked rise in the polymorphonuclear count.

L. T. Swain (*J. A. M. A.*, July 27, 1929), studied the effect of metabolism in chronic arthritis of all types. In 312 cases the rate was abnormal in 39 per cent; 14 per cent were plus and 25 per cent were minus. The basis used was between plus and minus ten. No extremely high or low readings were found. There was a tendency to low metabolism irrespective as to the type of arthritis. Age and sex had little effect on metabolism. No evidence was found of hyperthyroidism as characteristic of arthritis. That infective cases were apt to be plus, was not borne out. Thyroid medication in the low rates did not raise this rate in four-fifths of the cases. In spite of this, if thyroid is given over a long period, in small doses, beneficial results were recorded. The improvement was in circulation, muscle tone, weight and vitality. It also acted as a stimulator. Metabolic rates are not an indication of thyroid therapy in arthritis, as in forty patients out of fifty, the rate was unchanged after thyroid was taken. Harm can be done by over-stimulation and clinical observance is the best guide. He concludes: "Finally abnormal metabolism with a tendency to minus is characteristic of arthritis, especially in the early years, having a tendency to return to normal as the duration of the disease lengthens. The figures suggest that a low metabolic rate may be a pre-arthritis sign or the patients in the low group are those in whom arthritis develops."

Sea water injections, according to T. E. Lawson (*Pract.*, August, 1927), will often arrest arthritis when all else has failed. Five to ten hundred c. c. are given bi-weekly, intramuscularly. In 27 cases only three failed to improve in his series. Seven seemed cured, six were moderately improved, eleven were improved but had twinges of pain. Anorexia and depression result from over-dosage.

Sulphur is deemed advisable by Forester (*Prog. Med.*, November 13, 1926), in chronic

arthritis, but it must be used in non-oxidized form, viz., either as sulphuretted compounds or hyposulphites.

With the last two methods of treatment I have had no experience.

The second division of the proliferative type is the specific arthritis. Here gonococci lead, with tubercular bacilli and spirochoete following. The treatment is to attend to the gonococci infection first. Second to use diathermy to the prostate, and infra-red or radiant light to the effected joint. The vaccine is very useful. The tubercular joints will need orthopedic procedures and general ultra violet radiations. Luetics need antisyphilitic treatments and, while any joint may be involved, the sterno-clavicular one is the site of predilection in syphilis.

In the last group, arthritis deformans (rheumatoid arthritis) considered by many men as a severe grade of chronic infectious arthritis, the results are disappointing. This is a progressive type. Ankylosis occurs early. As a rule no foci can be found. It commences insidiously in the hands and feet. Nervous phenomena are usually present, with sweating and a glazed skin. The patient is pale and the circulation is poor. It occurs generally in adults who lead indoor lives. The cases that I have encountered were all far advanced, and I was unable to accomplish anything, except in one case.

Female, age 39, general history was negative. Ankles, knees, wrists were enlarged and painful for three years. She had received all sorts of treatments. As a last resort I coagulated the cervical canal, although there was no specific indication for this, with the result that in a short time the pain began gradually to subside, and there was less ankylosis. Now she is free from pain, but has a certain amount of stiffness.

Barrow and Armstrong (*California and West. Med.*, March, 1927), in studying this type of arthritis, by laboratory, X-Ray and physical examinations, demonstrated that 96 per cent out of 235 cases were definitely gastro-intestinal at first. Chronic "colon conscious" arthritis constituted the great majority, with appendicitis, colon stasis and the like following. The common protozoa found were *Ameba Histolytica* (dysenteriae) and *Chilomastix Mesnili*. In their treatment they used ipecac and its alkaloid, emetin, and the salts emetin-bismuth iodide. One-third grain emetin was given hypodermically by deep intramuscular injection on alternate days. After

three injections it was given intravenously. After three weeks it was given twice a week and then once a week. If any muscle tiredness or weakness arose, which indicated too much emetin, it was stopped. Arsenic was the second parasitic medicine used. Of a series of 209 cases, 26 per cent were classified as excellent and 17 per cent as good results.

At this point I might say that the fluoroscope will show if an iliac stasis or dilated prolapsed cecum is present. Constipation may be a factor and may originate from a gastroptosis or enteroptosis. In colonic stasis, producing a toxemic condition, with a resultant arthritis, *B. Acidophilus* will render the intestinal tract unfavorable to the growth of putrefactive bacteria. The urine can be tested for indican in these cases. In these abnormal bowel conditions, the sine waves are indicated, with high colonic irrigations. Do not overlook a stasis of the liver. This can be relieved by the use of the static wave current applied for twenty minutes with a metal electrode connected to the positive pole, the negative being grounded. A rather rare cause of arthritis may be due to a food anaphylaxis, and, when all has failed, one can make the various skin tests.

With reference to physical therapy treatments, no definite, dogmatic applications can be given. For the thin, anemic patient, ultra-violet from the mercury vapor, or carbon arc lamp can be utilized. For pain, diathermy heads the list. There is at our disposal, also, hot baking, infra-red, radiant light, hot whirlpool baths, and steam baths. When fibrosis is already well established the additional use of diathermy through the joint, followed by the use of the static wave current and sparks will at times give astounding relief, no matter whether these cases have arisen from trauma or local foci of infection. In some massive types of ankylosis, diathermy, forcible manipulation, static x-ray are indicated. X-ray in ionizing or substimulating doses, 5 ma. m. 5 inch backup, 1 m. m. al. filter and 8 inch distance, is given once a week to the joints and surrounding tissues. The affected joints should be kept in the best positions to prevent ankylosis, such as a cock-up splint for the contractures of the wrist flexors. To the wasted muscles, interrupted sinusoidal therapy can be used, especially to the thigh extensors when the knee is involved. Do not tire these mus-

cles. Massage is given to the surrounding tissues and muscles controlling the joint. A creeping board is useful for finger exercises. All exercises are enhanced if hypermia is first induced. As long as the joint remains hot, the disease is in its activity, and any exercises and movements must be used with caution.

In the second main type, namely, the Degenerative, the lesions are in the marginal cartilage and less frequently in the bone. The soft parts are not so much affected. Rarely is there an excess of joint fluid. They are therefore less painful and the cases are usually milder, as compared to type one. As mentioned previously they are generally non-infectious. This does not mean, however, that foci should be ignored, nor sought for. It has been my experience that the common foci, if any, in this type, is located in the gastro-intestinal tract. Many of these patients complain of flatulence, indigestion and constipation. The x-ray therefore is a valuable agent for a check up. Do not be too hasty in the removal of teeth in these elderly patients. Once they have lost their teeth, and their arthritis remains, their handicaps will be materially increased.

The first in this group is the arthritis of menopause. This is called by some metabolic arthritis, by others villous arthritis. This type is usually associated with general metabolic changes seen in individuals past middle life, as arterial sclerosis, obesity, and other signs of human decay. The endocrines may play an important part. Fever and inflammatory joint reactions are generally absent. For this reason they are considered as non-infectious. This does not mean, however, that arthritis in middle life cannot be infectious. As mentioned above the indiscriminate removal of teeth and tonsils is not advocated in elderly people. Under the x-ray, these cases show lipping and spur formation. If the patient is a female, at or after menopause, there is first noted a complaint of stiffness, especially in the knees. This is more pronounced on walking or climbing stairs. Examination of the joints show little if any swelling. Deformity is usually absent. In long standing cases, the heads of the bones are enlarged. Crepitus and joint grating is common in these cases. Ankylosis is not common, motion if restricted

is due to osseous spurs. Muscular spasm is absent. The whole progress is very slow.

The general treatment is to attend to the over-weight if present. Help metabolism with thyroid internally. If the patient is a female, the use of ovarian extract, especially at the climacteric stage is useful. Intravenous medication of iodides are tolerated exceptionally well. A diet consisting largely of vegetables, cooked and raw fruits is of benefit in these cases. The sine waves and colonic irrigations for gastro-intestinal disturbances have been found of value. Vaccines in my experience do no good in this type. These cases should also receive some analgesic preparation by mouth. I prefer a tablet that contains cincophen $3\frac{1}{2}$ grs., neosal 5 grs., colchicine salicylate $1/100$ grs. and thyroid $1/10$ gr. Diathermy to the involved joints give relief for pain. Galvanism is also beneficial to these joints, as is autocondensation when the bloodpressure is found to be high. Hot cabinet baths or hot tub baths, are also prescribed with benefit.

The second division of this type is the senile arthritis. Any and several joints may be involved. The joints all over the body naturally take on senile degenerative changes. The soft tissue shrinks from the absorption of fat, drying of secretions, and disturbances from poor circulation. These patients are generally advanced in years. Lipping is seen on X-Ray examinations. The same general treatment is given as mentioned above.

The third type in this group is monoarticular arthritis. It chiefly affects old persons and locates either in the hip or shoulder. If it occurs in the hip, as it frequently does, it is called *morbus coxae senilis*. Tuberculosis must be ruled out. Sometimes injury is the exciting cause. Ordinarily it is a degenerative affair. The muscles about the hip show early wasting. Foci of infection are absent. In one case of this type, the removal of Pyorrheal teeth, did no good. Diathermy through the hip joint as long as it was continued, was all that helped. Diathermy and autocondensation must be kept up in this type. The same general treatment as mentioned above is advocated here.

Arthritis Urica or Gout is a constitutional disease due to an excessive accumulation of uric acid and purin bodies in the blood. The metatarso phalangeal joint of the big toe is

usually affected, although other joints may be involved. Deposits of Sodium biurate are found in the tissues involved. The physical therapy treatment is radiant light, infra-red, hot water foot baths and galvanism. Lithium chloride ionization is useful at times. The foot is placed in a pan containing a 2 per cent lithium chloride solution and connected to the positive pole of the galvanic current, and treated for 15 minutes.

Herberdens Nodes come under Degenerative Arthritis. They are small bony outgrowths occurring in the phalangeal joints that develop gradually. They occasion slight discomfort in most cases. They may be the first indication of a general arthritis, and are most frequently seen in women.

Scapula Crepitus is a name applied to a grating produced by motions of the Scapula. It is usually tender at certain points. It may be due to small bursae or a dry condition of the muscle. Bony irregularities may be present. Diathermy or infra red will relieve the pain.

Villous Arthritis means that there is a marked thickening and proliferation of the synovial fringes with formation of villi. This may occur in both the proliferative or degenerative type. Some men refer to the arthritis that occurs at menopause by this term.

Charcot's joint disease is a destructive form of arthritis secondary to locomotor ataxia or syringomyelia. It is classified under type two. Pain is not so pronounced. The chief complaint is weakness and insecurity. The progress is often rapid. The knee is usually affected. A brace, affording limited motion, gives the best prospect of relief.

Still's disease is the arthritis deformans of childhood. It is classified under type one. There is a general enlargement of the lymph glands and the spleen. There is a gradual onset of joint stiffness and swelling. Children with this affliction are apathetic, listless, and emaciated. Secondary anemia is present. The skin is lifeless and easily acquires bed sores. Physical therapy measures are: ultraviolet for anemia, infra red and diathermy for pain and massage and sine waves to tone the flaccid muscles.

Mechanical injuries to joints, fractures in the joint, poor circulation from an old trauma, interferences with nutrition, injuries to soft

parts, may be the cause of chronic traumatic arthritis.

In conclusion the causes of chronic arthritis are varied and many. The treatment is difficult and not always successful. Physiotherapy however plays an important part in the treatment, and is, with its various modalities, of diathermy, static, light, x-ray, galvanism and the like indicated.

The classification of Proliferative (Atrophic) and Degenerative (Hypertrophic) chronic arthritis, with their subclassification, is apparently based on definite pathological and etiological grounds. The proliferative type usually occurring in the young is always infectious, very progressive and painful, and with one or more foci to be sought for. While the degenerative occurs more in the older individuals, with other degenerative processes. It is less painful, but tends to ankylosis. It is usually non-infectious, and the progress is slow.

Discussion

DR. J. C. ELSOM (Madison, Wis.): I want to express my appreciation of this very excellent paper by Dr. Seybold. I may say that it is very easy indeed to discuss arthritis because every man has his own opinions, but after all none of us knows very much about it. That is the way it seems to me. The very multiplicity of the term in itself is absolutely confusing and perhaps is an indication of our lack of uniformity of conception as to the nature of the disease.

At any rate, I think it is true that the active infectious process found in arthritis seems but a single incident in a long train of events. I think we must bear that in mind. The endocrine element, which is mentioned by Dr. Seybold, no doubt plays a part. This is probably true in what has been termed menopause or climacteric arthritis, and perhaps it should be considered as due rather to the metabolic changes which are occurring during those periods and to the lessened powers of resistance of the individual.

We know an arthritis occurs in almost all climates, certainly in the temperate and humid climates more especially. Arthritis is rare in the tropics. That is a rather interesting thing. Whether the effect of the ultraviolet, which is supposed to be so abundant in that section, has any influence one does not know; yet it is safe to agree, I think, that the ultraviolet has a very marked effect on arthritis. This is particularly true, perhaps, if we consider the endocrine theory because we know that the ultraviolet is a marked stimulant of the endocrine functions.

As to the focal infections, we find there is nearly always an infection of the streptococcic type, and any streptococcic invasion perhaps predisposes at least to arthritis. Dental infections we know,

while not always the cause of arthritis, are frequently so. And the streptococcus salivarius which we find in the mouth around the teeth has been proven to be a very active agency in the causing of arthritis. Yet we also know that people who have strongly infected teeth have no arthritis; so again we have a confusion.

Brock in the Mayo Clinic in 1921 produced arthritis in 144 animals out of 160 by the injection of streptococci isolated from infected teeth. That seems to me rather an interesting thing.

After all, I suppose that arthritis, as well as other diseases, are dependent on one's power of resistance and the strength of their defense. The degree of dental infection, perhaps, seems of small moment in these cases. So we say that no doubt the onset of disease has been caused by an overload of infectious material.

Some recent experiments on rabbits have been performed by some English investigators. The hind quarters of the rabbits were placed in ice-cold water for a rather long time and then streptococcic cultures were injected into these exposed rabbits, as well as into rabbits which were used as controls. It was found that in this first group, that is, those rabbits exposed to the ice-cold water, every one of them developed severe arthritis, and in the latter group no lesions developed at all.

I believe that we have in heat one of the most universally indicated agencies for the relief of these conditions; certainly for the relief of symptoms. While perhaps the heat does not cure, it produces

a very marked beneficial effect. Heat, in connection with the ultraviolet, may be administered of course at the same time by the carbon arc lamp. It is my opinion that perhaps we do not use the carbon arc enough in these cases of arthritis. The benefits of this agency have been extolled many times. From it we get a combination of all beneficent rays of the spectrum, both the ultraviolet and the infra red. It is worthy of greater usage.

As to manipulation and exercise, I should like to have time to say a word. I think in all but the acute cases where there is painful motion, movement should be encouraged because we know it prevents ankylosis and this is certainly greatly to be desired.

DR. N. J. SEYBOLD (Toledo, Ohio): In the whole realm of medicine, there is scarcely a condition we are called on to treat more frequently than arthritis, and I want to say that the results at times are extremely unsatisfactory as well as discouraging to the patient.

Another thing: Never give a patient of this type a bad prognosis because there is a definite mental side to every one of these patients, and a bad prognosis in all probability will make these patients worse.

Whatever classification you decide to adopt, I think you should thoroughly familiarize yourself with it so that when an arthritis patient presents himself you can automatically begin to classify him in your own mind as to what type of treatment you think you would like to outline.



SURGICAL DIATHERMY IN ACCESSIBLE NEOPLASMS ABOUT THE HEAD *

G. W. BOOT, M.D.

EVANSTON, ILL.

According to the reports from the Illinois State Board of Health the death rate from cancer has remained constant for two years at 106.4 per 100,000 and almost constant for the last five years. The deaths from cancer of the buccal cavity are given as 238 out of a total of 7887 deaths from cancer in 1928. This I feel is considerably below the total number of deaths from cancer of the mouth. It is so easy to certify a death as due to the terminal factor such as pneumonia that the real cause, cancer, is apt to be concealed, particularly if there is some reason for it, such as getting life insurance. We are seeing more cases of cancer of the ear, nose, throat, and mouth at Cook County Hospital than ever before. This year up to Oct. first we have had admitted to Ward 21, 112 cases diagnosed as cancer of these parts.

The etiology of cancer is still a matter of dispute among those investigating the disease. Some claim it is hereditary, some think it due to bacteria, many think irritation is the cause, some think tobacco is a factor, some alcoholism, others syphilis and so on. The probability is that like the blind men who examined and described the elephant, each sees but one part of the problem and is partly right in his description. If it is due to heredity, whence came the first cause? Did we inherit it from our lowly ancestors? For cancer has been reported as afflicting all forms of vertebrate life. If it is due to bacteria, why can we not reproduce it by inoculation of bacteria and why do not the bacteria act as other bacteria act when inoculated? If it is due to irritation, why do not the men of this country have an overwhelming percentage of cancer of the face from the irritation of shaving? If it is due to tobacco, why is it that so many people smoke most of their lives and yet escape? If it is due to alcoholism, why is the death rate not declining in these days of prohibition? If it is due to syphilis, why is it that so many

patients give a clean history and show a negative Wassermann?

It seems to me that *Loeb's work on the artificial fertilization of sea urchins' eggs throws more light on the etiology of cancer than has any other work done on cancer. Loeb found that by physical and chemical means he could cause unfertilized sea urchin eggs to develop. He found that he could use different chemicals and in different concentrations, that the physical means needed to initiate the process were not always the same. In other words, the artificial fertilization was a physico-chemical process.

Cells which have reached their full development do not multiply. A fully developed epithelial cell is a finished product. New epithelial cells are always formed from the deeper cells which have not yet reached their full development. There is always such a layer of incompletely differentiated cells lying in the deepest layers of the skin or other epithelial structures. These are the real cell rests that a certain school of pathologists attribute the origin of cancer to and they are right, though not in the sense that they claimed. Now what makes this layer of cells develop and run wild in the new growths we call cancer? We know that proliferation of this layer of cells is stimulated by injury to the overlying cells and that when they need to be replaced the deeper lying cells proliferate more rapidly than usual to replace the cells which have been destroyed. We also know that tar repeatedly applied to the skin causes proliferation of these cells. This is shown by the production of tar cancer—a fact which is beyond dispute.

Is cancer hereditary? Yes, in the same sense that tuberculosis is hereditary. The predisposition, or rather the possibility of developing these diseases is doubtless present, else who could ever develop either tuberculosis or cancer. But some other factor is necessary. The very fact that the hereditary ad-

* Read at the Eighth Annual Meeting, American Congress of Physical Therapy, Chicago, November 4, 1929

* Jacques Loeb Die chemische Entwicklungserregung des tierischen Eies. Julius Springer, Berlin, 1909.

vocates have to invoke irritation to explain some cases shows that heredity is not the only factor involved and some of us think that it is quite a minor factor in the development of the disease.

Cancer then is an abnormal overgrowth of cells of epithelial type, which overgrowth is not accompanied by the proper mechanism to keep its cells alive. There is no development of circulation in a cancer. The result is that the cells die and the products of their death together with secondary infection that occurs causes the cachexia to which the patient succumbs, or pressure on important organs so interferes with their function that life is impossible. Again cancer cells when displaced have an unusual power of development and cause secondary growths in a way that normal cells do not.

It is hardly necessary to speak of the inefficiency of ordinary surgical treatment. You all know how poor are the results of ordinary surgery. If you can get the cancer in an early stage of its development and cut it out widely enough you have a chance of curing your patient, but if the disease is at all advanced you do not cure him and in many cases you only hasten the inevitable end. The very manipulation necessary in removing the growth gives rise to metastasis. As to radiotherapy by x-rays and radium their use in cancers of the province under discussion is almost equally futile. How many times have we seen cancers treated by radiation disappear and apparently be cured for a short time only to recur either locally or at a distance? Why is this? It is known that radium and x-ray cause sealing of the lymphatics and closure of the blood vessels from swelling of their endothelial lining, and that this may be sufficient to stop the spread of the growth temporarily, but the original cells are apt not to be destroyed unless the whole structure is destroyed by a burn. In this case you have a nasty sloughing sore with devitalized cells on the floor of the ulcer to deal with. There is much reaction and the results are not at all pleasant for either doctor or patient. The very fact that it is so difficult to place the dosage where cancer cells will be killed while normal cells will not be injured makes the user of radiation cautious and he fails to use enough, thereby only sealing vessels and retaining cells still capable of producing the

malignant growth. Again, since it is known how many men have died of cancers initiated by x-ray and other radiation, there is no doubt that such radiation does cause cancer. How then can you prevent its causing cancer when you are treating cancer by such means? How can you use it in sufficient amount to destroy cancer cells without at the same time having it the means of inducing cancer in other cells which have received a smaller amount? Is it not much like playing with fire?

In diathermia, on the other hand, we have an agent which we can control and which also seals up the vessels while it destroys involved tissue. I have never seen a case report of cancer due to the use of diathermia. I have found it the most useful means we have at our disposal and I use it in two ways—for coagulation and cutting.

Whenever it is possible I use the high frequency cutting current and dissect out the growth just as one would do with the scalpel. If the growth can be removed without any cutting into it the wound is closed with sutures as any clean-cut wound would be and heals by first intention. If there is any question about having removed all the growth the suspicious portion is coagulated as deeply as possible to destroy all of the growth. Coagulation is also used where it is not possible to remove the growth with the cutting current. The open ulcer is then filled with sterile vaselin, and packed with gauze, after which it is dressed daily until the slough separates. The great advantages of the cutting current over the scalpel are the sealing of small vessels and lymphatics and the absence of hemorrhage unless some good sized vessel is cut.

The advantage over radium lies in the fact that tissues which we do not wish to destroy are not devitalized and that healing is prompt and not delayed for weeks by tissue which has too little vitality to react. Also we are in no danger of inciting cancer in tissue which is not destroyed. Either the burned tissue is destroyed or it reacts promptly and heals. A further advantage is that there is no toxic action. The patients do not get sick after the use of diathermia and they are remarkably free from pain. Even though the patient is not cured he is made much more comfortable while he lives. There is a very wide range of usefulness for this form of treatment. I have

excised the whole body of the mandible, half of a mandible, cut out half of the tongue, destroyed tonsillar areas, cut out cancer of the submaxillary gland, destroyed the auricle and its vicinity and have repeatedly tied the common carotid in doing this work. In one case I not only tied the common carotid but cut it off together with the internal jugular vein and the pneumogastric nerve because they were all hopelessly involved in a mass of carcinomatous glands. In this last case the patient's only complaint was that I would not let him go to the toilet room for a week after the operation.

In many of these cases local anesthesia by nerve blocking and regional infiltration can be used. Where local anesthesia is not feasible I do not hesitate to use ether. To avoid explosion I wait a short time after the patient is fully anesthetized before using diathermia. During this wait the mask is completely removed and the ether in the patient's lungs is diluted by a minute or two of quiet respiration. Then diathermia is gone ahead with as if the patient has not taken ether. I have had no accidents with the ether used in this way. Sometimes I have used colonic anesthesia but the anesthetic is hard to control when used in this way. At other times I have used chloroform, but when chloroform is used there is apt to be so much reaction owing to its poisonous effect on the liver that I prefer to avoid it when possible.

Gas can be used in operations on the outside of the neck, but it is not suitable for operations where the mouth must be kept open, such as diathermia of the larynx under suspension.

In operating for cancer it is necessary to be radical. This is particularly true in the neglected and far advanced cases we get at the county hospital. It is necessary to destroy all the growth whether it is macroscopically visible or not, if the patient is to be cured. However, even though all is not destroyed and the cancer recurs, its growth has not been accelerated and the patient does not suffer any more than he would have suffered if the growth had not been interfered with. In short, provided we are dealing with an accessible growth, we have, in diathermia, a means of treatment that is far ahead of any other means now at our disposal.

813 Sherman Ave.

Discussion

DISRAELI KOBAK, M.D., (Chicago.): In order to establish a proper background to my discussion I wish it to be known that I have enjoyed professional contact with the essayist over a period of years at the Cook County Hospital. Those of us who have been in contact with him appreciate that it must have taken extraordinary conviction to have changed his early pessimistic views to those announced by him today. Anyone who is surgically oriented and who utilizes a proper technic will confirm Dr. Boot's favorable experience. He will observe that protein coagulation always follows the application of diathermic currents when intensities beyond physiologic limits are used. And associated with this reaction is always to be observed the stoppage of bleeding, the checking of hemorrhage, the blocking of nerve endings which produces results similar to Crile's anoci-association theory. The patient is remarkably free from shock.

A knowledge of tissue reaction with a diathermic current is important, because intense currents produce superficial coagulation and slower coagulating currents produce deeper effects. Cutting effects can also be elicited from a specially constructed high frequency instrument. Such a current will produce cutting and coagulating reactions at the same time. One can therefore excise and inhibit bleeding at the same time. But the cutting differs from the ordinary rough dissection in that it obliterates all anatomical landmarks and hence it does not compete with nor is it equal to the blunt dissection method. I recall Dr. Galloway's experience when he attempted to excise a tonsil with a high frequency cutting current. He had bleeding and soon confessed that he had difficulty in keeping track of his anatomical landmarks. The bleeding was due to the current being regulated more for cutting and less for coagulating.

The early recognition of cancerous growth is at present stressed by the entire medical profession. One cannot stress this point too often, because any curative effect that may be obtained with this or any of the other recognized measures depends on the early eradication of the neoplasm. And in this connection I wish to add my voice to the admonition of the essayist not to traumatize or overmanipulate the field of operation. Metastatic growths usually arise from rough handling of malignant tissue. I am convinced that surgical diathermy is one of the most potent measures at our present command in combating cancerous growths.

DR. NOVAK: I just want to ask whether you are using surgical diathermy in cancer of the larynx?

CHAIRMAN GALLOWAY: What have you to say about it, Dr. Novak? Dr. Novak, as you know, was the pioneer in using surgical diathermy in the larynx under suspension.

DR. NOVAK: I have had no occasion to change my opinion on the value of diathermy in malignant tumors of the larynx. My experience of several years has confirmed the statements which I made in regard to this matter. I will say, however, that while I do not believe that radium or x-ray is of any particular value in the treatment of malignancies of the larynx, I do believe, that radium preliminary to electrocoagulation, is of very definite value. I

base this on several cases, one of them which was not, however, a laryngeal tumor.

DR. M. H. COTTE: Dr. Boot's paper, to me, has been quite significant because of its clear, concise and complete nature. He has stated in one sentence, so to say, the whole situation with reference to diathermy in neoplastic disease, excepting, perhaps, for one point: He has limited himself, probably consciously, to the malignant neoplasms only. I should like to say a word about non-malignant neoplasms. I refer particular to small swellings of the larynx, especially of some of the vocal chords.

In the last year I had occasion to treat three tumors right on the vocal chord. I used diathermy under local anesthesia and indirect illumination. The method proved to be successful so far as can be seen, and so far as the patient is concerned. There was complete relief of the most important symptom, hoarseness.

When diathermy is employed the scar that is left is as soft and pliable as you can get with any method. I can sustain the opinion that the use of ether does not contraindicate the use of diathermy.

CHAIRMAN GALLOWAY: Is there any further discussion or any questions?

Of course, you know I am very enthusiastic about surgical diathermy in malignancies. When Dr. Kobak initiated me into this work we saw in my wards numerous cases that were considered hopeless. We resurrected cases that had been put in the ward or sent out to Oak Forest with only the expectation, or practical certainty, that they would die. Since then we have had the great pleasure of seeing some of these cases cured, all of them palliated, and most of them given a year or two of comfort and happiness. Of all the other measures I have seen used in these malignancies, especially the more or less advanced cases that Dr. Boot has mentioned, nothing has given me the same optimism and the feeling that finally we are not only going to conquer a small percentage of these terrible malignancies, but certainly give many the relief which they are seeking.

DR. BOOT: I shall make an original diagram here (drawing on blackboard). This represents the surface of the body; this the portion destroyed by radium. This portion where the epithelial cells are is not sealed in, and this, the part beyond where the cells are stimulated.

I have given a good deal of thought in the last

three years to the etiology of cancer. I am satisfied there are two main factors involved in the production of cancer: One is a very slow process which has gone on for years which slowly changes the composition of the fluids surrounding the cells, and one other factor, the immediate thing which causes the cancer.

The cells which develop into cancer are sensitized by this long process which has gone over a course of ten, fifteen, twenty or thirty years. They have gotten in a position where they are all ready to turn over by just a little of something else added which comes in the way of an injury.

We destroy this part and seal up these, and they still remain. The other cells around here are in a state of stimulation all ready to become cancerous cells if they have something added to them. It takes cancer some little time to develop when the cells are stimulated. These cells are in that position all ready with a little stimulation. After two or three months, or six months, you have a cancer right back again either there or somewhere else.

I recall one man mortgaged his house in order to get enough radium to have his throat treated. In about three months he had recurring cancer in the back of his neck and left humerus and died a horrible death. I think radium in these cases is almost worse than useless. You take the patient's money and leave him worse off in the end.

You do not do that with diathermy. You either kill the parts or do not kill them. That part that is not killed immediately reacts and it heals up; if you got all of it, well and good; if not all, it recurs, of course. But if the patient is not made worse, you can do something that gives relief, if only for six months. It is not expensive. You do not have to invest in \$10,000 worth of apparatus. You relieve the patient for the time being at least.

When it comes to carcinoma of the larynx, if the cancer is intrinsic and I think the patient has a chance to be cured by laryngectomy, I turn him over to some other member of the staff who has had better success than I have. If the case is one which cannot be cured by laryngectomy, I am not in favor of treatment.

As to the use of x-ray preliminary to diathermy, I think it is a good thing in helping seal off the cells in the vicinity, but so far as cure, no, I do not think it does.



MULTIPLE X-RAY CARCINOMAS FOLLOWING PSORIASIS *

CASE REPORT AND COMMENT

HERMAN GOODMAN, B.S., M.D.

and

CHARLES W. PRICE, B.S., M.D.

NEW YORK, N. Y.

According to MacKee, Strater seems to have been the first to treat psoriasis with x-ray (1900). Hahn, Albers-Schoenberg, Startin, and others reported cases about the same time. In this country (still quoting MacKee), the first to report on the roentgen ray treatment of psoriasis were Williams, Pusey, Allen, Morton, and Zeisler.

Case Report

Mrs. M. N., a white woman of 43 years came to the Out Patient Clinic of the New York Skin and Cancer Hospital on June 30, 1928. She was 5 feet, 7 inches tall, and weighed 179 pounds, evidently in good nutritional condition. She had been born in the United States. She complained of an eruption of the skin, and clinical examination disclosed typical psoriatic patches over the extensor surfaces of the legs, arms, and patches on the back, elbows, and knees. (Figures 1 and 2.) The skin of the psoriatic patches was thin, scaly, and varied in area from small dime-size lesions to lesions of several inches in diameter. In addition to the psoriasis, the patient presented areas of dermatitis about the extensor surfaces of both the elbows and knees, extending to the contiguous portions of the upper and lower arms, and the upper and lower legs, respectively. Taking the tip of the elbow and the center of the patella as central points, the radio dermatitic areas extended no less than four inches up and down, or two inches across in any direction. These areas were typical of radiodermatitis, and demonstrated telangiectasia, atrophy, pigmentation, keratosis and ulceration. Examination under filtered ultraviolet showed the fluorescence associated with long standing radiodermatitis.

The measurements of the areas were:

Left arm: $7\frac{1}{2}$ by $4\frac{1}{2}$ inches—ulceration $1\frac{1}{2}$ inches in diameter.

Right arm: $8\frac{1}{2}$ by 4 inches.

Left knee: $7\frac{1}{2}$ by 4 inches—atrophic ulcer in centre.

Right knee: 6 by 4 inches—ulceration to right of area $\frac{3}{4}$ inch in diameter.

The ulcer on the right knee was shallow, and presented a sloping border with a necrotic base. The ulcer on the arm was covered by a crust, and its border was distinctly elevated.

A portion of the psoriatic skin was removed for section and the histologic diagnosis of psoriasis was made. Part of the largest ulcer was likewise removed for study, and the section showed infiltration of typical prickle cells in nests. The connective tissue beneath them was acellular, and at one end there was an ulcerated area. The pathologic diagnosis was made of prickle cell "epithelioma."

The patient gave several conflicting or non-confirmative stories as to her treatments. The psoritic lesions supposedly, developed about 30 years ago, at about the age of 13. No other member of her family had the same or similar disease. About twelve years ago, she had a course of x-ray treatments which cleared the lesions. At this time she recalls indefinitely the number of exposures to any one location, but thinks that the complete number was between 12 to 20. Six years ago, she again was treated with x-ray for psoriasis. Treatments were administered once a week, then once in two weeks, and so continued for more than a year. At the close of this series of treatments, she complained of pain in the left knee. Consultation was obtained and the diagnosis of x-ray dermatitis followed. A number of exposures to the conventional sources of clinical ultraviolet radiation was given. About six months ago, the left arm evidenced ulceration; later the ulcer of the right knee appeared.

* From the New York Skin and Cancer Hospital.

After consultation with her sister, the patient revised her story: At the age of 15, she developed psoriasis, and it was six years ago that she had 12 typical exposures to x-ray, following which the lesions disappeared for one year. When the lesions of psoriasis reappeared, she presented herself to a physician for treatment and received further x-ray exposures at intervals of 7 to 14 days for one year. She estimates that during this year she received no less than one hundred exposures (obviously impossible). At the end of this course, about four years ago, she noticed inflammation, and was told in Philadelphia that she had a new affliction due to overdosage of x-ray. The affected areas have become progressively worse since then, and about six months ago, showed signs of ulceration.

The first physician who treated her with x-ray for psoriasis is dead. It is impossible to get confirmation of other data.

Discussion

In the days before x-ray, carcinoma on the basis of pre-existent psoriasis was known. Although its literature is meager, one should not overlook the possibilities of such carcinoma formation on the basis of psoriasis. There is, however, no evidence of telangiectasia present in such instances. In the pre-roentgen ray period, the affection was described as carcinoma of the skin on the existing or previously existing psoriasis, with arsenic as a complicating factor, or a pure psoriasis carcinoma. Arthur Alexander in 1920, assembled 18 of such patients. Of these, 11 were considered as malignant degeneration of arsenical hyperkeratosis or arsenical carcinomas on psoriatic basis. The remaining seven were considered as pure psoriasis carcinoma, indicating that the psoriasis lesions were converted to the epitheliomas directly.

This would seem to indicate to us that the psoriatic skin has some feature of unrest, and that the added irritant of arsenic, or of the reducing agents employed in salves, may initiate changes leading to cancer cell proliferation. Rowntree has regarded the x-ray cancer as the result of the application of a specific irritant, and in view of its incidence and specific character to have considered it as the most specific of all human cancers. Indeed, he even claimed that in x-ray cancer, we possess the only clear cut and well defined ex-

ample of experimental production of cancer in man.

This seems to have been recognized, and warnings have multiplied in regard to the application of x-ray in psoriasis. Highman and Rulison have written: The object of roentgen ray treatment is to inhibit epidermal hyperplasia, and promote resorption of inflammatory deposits. The rationale of this treatment is a direct attack on multiplying cells of the rete, and small round cells in the infiltration which probably by analogy with lymphocytes are vulnerable to the rays. The main technical difficulty lies in the fact that the scale acts as a screen in direct ratio to its thickness. The majority of lesions disappear under intelligent treatment. Some are inexplicably obstinate, and if unresponsive after six exposures the attempt to remove them by x-ray should cease.

Other observers have stated that psoriasis may develop an immunity against the beneficial influence of roentgen ray, which in a way is a protection to the average patient. In such instances, roentgen ray should be discontinued. Again, MacKee has said that if the

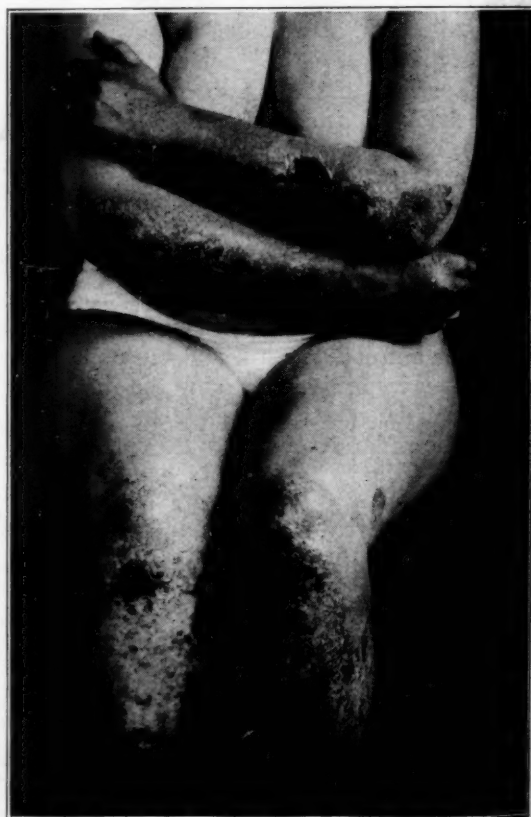


Fig. 1. Showing involved areas on arms and knees.

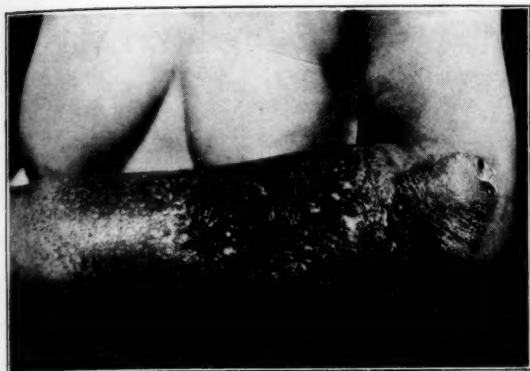


Fig. 2. Closeup of left arm.

psoriasis does not clear up after three treatments of $\frac{1}{4}$ skin units per week, some other method of treatment should be instituted. Good judgment is a valuable requisite in using x-ray and radium for treatments of recurrent attacks of psoriasis.

It is generally admitted that the use of x-rays results in clinical alleviation of the symptoms of which the patients complain, namely, the eruptive elements. Should it be the first line of the physician's attack? Should it be the only method used? Should it be used if the patients report that x-ray had already been exhibited for the clinical improvement of the very areas which show recurrence? Is there any method by which the idiosyncrasy of the patient to x-ray exposure can be determined?

It is far too soon to give any absolute opinion, but it seems to us from our preliminary work with filtered ultraviolet radiation in the examination of the skin that the appearance of the radiated skin will be indicative of over exposure to x-radiation sooner under this form of clinical examination than in ordinary

white light. X-ray sequelae, both early and late, have been detected under filtered ultraviolet radiation for some time. We hope that we will be able at some future date to give our findings in x-radiation patients examined under the black light filter.

In the meantime, this case report indicates the need for again emphasizing the fact that x-ray in such a process as recurring psoriasis should be used with utmost caution, and that every effort should be made to learn from the patient whether previous exposures to x-radiation have been experienced. Certainly, the opinion expressed that if clinical improvement is not attainable after three to six exposures, some other method of therapy should be used is a good one. After all, physicians treated psoriasis long before there were x-rays, and possibly it would not be a bad idea to return to pharmaceutical therapeutics in such physiological conditions as acne and psoriasis. Many methods have been suggested for the treatment of x-ray changes of the skin from purposeful or accidental over radiation. The use of the clinical sources of ultraviolet radiation as from the mercury vapor arc in quartz has been suggested, and reports are available of its effectivity. Early excision of the ulcerating areas and skin grafting have cured the condition in some instances. Favorable effects by electrocoagulation, electrodesiccation, high frequency, endothermy have been reported in the literature at different times; each has its originators and proponents. Radium treatment of x-ray cancers has also been proposed, and has its champions.

Our patient was referred to the surgical department of the hospital, and the procedure to be followed has not been determined as yet.



INFLUENCE OF ULTRAVIOLET RAYS ON PERIODONTAL DISEASES *

A. T. RASMUSSEN, D.D.S.

LA CROSSE, WIS.

The periodontal tissues, while slightly modified histologically, are essentially the same as those of other parts of the body. The periodontal membrane is a modified periosteum. The maxillae and mandible differ from the other bones only in form. The periosteum overlying them is exactly like that of other bones, while the mucosa and sub-mucosa is not greatly different from that found in other parts of the body.

The same biologic laws apply here as elsewhere. Pathologic processes are the same no matter what part of the body is under immediate consideration. The periodontal structures react to the same biochemical disturbances as do the tissues of parts most remote from the mouth. The same principles of therapy apply here as elsewhere.

In view of the foregoing it naturally follows that any treatment, method, or modality that will tend to restore diseased cellular structures of other parts to normalcy has a place in the treatment of periodontal diseases. These facts should be kept clearly in mind when discussing any treatment given for its effect upon this class of diseases.

Before taking up more specifically the influence of ultraviolet rays in particular diseases it is well to study briefly the effect of the rays on cellular structures generally.

Life, as we have it in the world today, has been developed throughout the ages in the presence of ultraviolet rays from the sun. That is one of the reasons we have the kind of life on the earth that we do have. The rays from the ultra-violet section of the spectrum are vital to the growth and health of all animal and most plant life. Modern civilization, with its unnatural living conditions, especially in our large industrial centers, has deprived us largely of the effects of these rays.

It has been found, and well established, that certain sterols of both vegetable and animal

cells are so affected by these rays that they activate the metabolic processes of the animal organism to normalcy.

Disturbed mineral metabolism is corrected by ultraviolet radiation.

Since we know that calcium, phosphorus, iron, etc., play such an important role in maintaining the health of the individual it follows that anything which tends to restore to normal a disturbance in the balance of these minerals in the body fluids holds an important place.

It has been generally accepted as fact that only the near ultraviolet rays had any appreciable biologic effect, and that the calcium fixing properties of the rays were confined to that part of the ultra-violet zone having a wave length about 2900A°. However, in 1928 Goodman and Anderson say of rays shorter than 2900A° that "recent experimental work proves that these radiations are very effective in curing rickets, and in activating cholesterol, footstuffs and oils."

That the far ultraviolet rays are more highly bactericidal than the longer rays I believe all will agree. This, of course, is due to their destructive effect on the protoplasm of the cell. Their cytotoxic properties should be kept clearly in mind when using the rays for their bactericidal effect or undesirable results may follow.

Ultraviolet rays have a marked analgesic effect in painful inflammations. This has been demonstrated many times.

The stimulating effect of these rays is readily observed, but like other stimulants, if carried too far the effect becomes depressing, even to the point of destruction of the cellular structures directly exposed, and marked depression of the metabolic processes of the whole organism. This is an important point to keep in mind in order to guard against over exposure.

With this brief study of the biologic effects of ultraviolet rays we will take up briefly their influence on some of the more common

* Read at the eighth annual meeting, American Congress of Physical Therapy, Chicago, November 4, 1929.

periodontal diseases. Time will not permit a detailed discussion of the diseases affecting the periodontal structures, so for the purposes of this study let us think of them as coming under three heads as follows:

1st. Inflammatory conditions resulting from trauma, chronic irritations or drugs.

2nd. Infections, the result of specific pathogenic micro-organisms invading the tissues.

3rd. Lesions resulting from, or a part of some general systematic disturbance.

Lesions coming under group one, having as their primary cause trauma of some kind, or chronic irritation, be it from broken down teeth, filth, poorly constructed or improperly fitted crowns, bridges, etc., or poorly contoured or overhanging tooth fillings, may range in severity from slight inflammation of the gums to extreme tumefaction with resultant vascular congestion, followed by infection and necrosis of the parts. The same is true if such inflammation is caused by the ingestion or absorption of some drug or mineral such as mercury, bismuth, lead, etc., or their salts.

Ultraviolet radiations may, and will assist in reducing the congestion, bringing about a better circulation of blood in the parts, thus reducing the swelling, pain, and hemorrhage if present.

It is self-evident, however, that no permanent relief can be expected until the cause of the disturbance is removed, viz., the cause of the trauma or irritation. With this accomplished the further irradiation of the parts will materially hasten the return to normal.

In the second group, where the disease is a specific infection of the tissues, ultraviolet rays will be found very helpful in destroying the pathogenic micro-organisms responsible for the disease, as well as correcting certain systemic disturbances the result of such infection.

As a result of infections, whether acute or chronic, we usually find a lowered alkali content of the body fluids. Irradiation of the body with ultraviolet rays tends to bring this back to normal, while the local irradiation of the infected periodontal tissues, using more of the far ultraviolet rays, will stimulate them to increase cellular activity, promote free circulation through the capillaries of the parts, in this way carrying off more rapidly

the bacterial toxins, while the increased number of red blood cells convey a more abundant supply of oxygen to the cells. In addition the local irradiation will destroy those organisms coming into optical contact with the rays, thus materially reducing the number of pathogenic organisms present.

As an example of this group may be mentioned Vincent's Stomatitis, a disease resulting from a symbiosis of the spirochete of Vincent and fusiform bacilli. Being anaerobic organisms it follows that the oxidizing effect of the rays will inhibit their growth in the tissues while the increased phagocytic action of the leukocytes rid the tissues of the infecting organisms, allowing the structures to return to normal.

The coagulation time of the blood is lengthened in cases of Vincent's infection, sometimes to a point of grave danger. Ultraviolet radiations will decrease the clotting time in such cases, this being undoubtedly due to the resultant increase of calcium in the blood.

This decrease of the coagulation time in Vincent's stomatitis is very important in that the hemorrhages from the parts involved are sometimes severe enough to be in immediate danger to life. Then again, when the blood clots normally, it permits the thorough curettment of the pockets found about the teeth, as well as the teeth themselves for the removal of every particle of calculus or other irritant. This curettment and the elimination of all pockets or crypts about the teeth, removal or proper restoration of all broken down teeth; in other words the elimination of every type of irritation is absolutely essential in effecting a cure of this stubborn disease. Proper diet and such medication as may be indicated are important, of course, if the patient's best interests are to be served.

From this it will be seen that while ultraviolet radiations are an important phase of the treatment of this disease, it must not be depended upon as the sole agent necessary to effect a cure.

Many of the things I have just said of Vincent's infection might with equal truth be said of other infections. Encouraging free circulation; increasing the oxygen carrying capacity of the red blood cells; stimulating the phagocytes to increased activity; all are important in the treatment of any case

of infection, whether of the periodontal structures or elsewhere.

Under group three come all periodontal diseases which have as their primary cause some underlying systemic disease or disturbance of the metabolic processes.

Periodontoclasia, or osteoclasia of the alveolar process may be due to several primary causes. Any chronic irritation such as mentioned earlier in this paper may lead to infection and osteoporosis in which case a suppurative periodontoclasia results. In these cases the difficulty does not lie in controlling the suppuration. This will usually cease with the removal of the irritant, or elimination of the pockets or crypts harboring the pus organisms. Very often, however, sufficient bony tissue has been destroyed so that the teeth are more or less loosened. What is left of the alveolar process may be so weakened from osteoporosis that sufficient support is not given the teeth to withstand the stress of mastication. In such cases the teeth themselves act as irritants every time the jaws are closed so that still further osteoporosis results.

In such cases irradiation with ultra-violet rays will cause recalcification of the bones to take place so that they are able to properly support the teeth, provided, of course, that the destruction has not been too great, before treatment was instituted, or that some other contributing cause prevents the tissues from responding normally.

Osteomalacia frequently affects the alveolar process to a point of complete destruction when it is not noticeable in other bones of the body due to their denser structure. This condition is evidenced by a progressive and persistent wasting away of the process with resultant recession of the overlying gums and loosening of the teeth.

No evidence of infection exists and yet in spite of all local treatment the condition progressively grows worse until the teeth are lost, and even then the process goes on until frequently the alveolar ridge is more or less completely absorbed.

This is a deficiency disease.

When the calcium and phosphorus of the blood goes below normal for any reason whatsoever, whether it be from a lack of these minerals in the food, or a lack of proper activators, the system draws upon the

only available source of these minerals, namely, the skeleton. In order to sustain life the mineral contents of the blood must be kept within very narrow limits. Therefore, with a lowered calcium or phosphorus index demand is made upon the bones for these minerals.

While all the bones of the skeleton are affected, those will naturally show the effects most whose mineral contents are most readily absorbed. It follows, then, that the highly vascular alveolar process will give up its mineral salts more readily than the denser bones in which there is not such a free circulation of blood.

What is needed in these cases is something that will activate the metabolic processes so that instead of continually drawing out the mineral salts from the skeletal bank, as it were, these salts will be assimilated from the food and deposited in the skeleton to the point of normalcy.

This may be accomplished in one of two ways, namely, irradiation with ultraviolet rays, or giving some substance that has been activated by these rays such as cod liver oil, irradiated ergosterol, or some food that has been activated by the rays. Hypothetically it is vitamin D that thus activates mineral metabolism. Whether or not such a vitamin actually exists is a question. There is quite some evidence to show that it does not, and that the power of calcium fixation exhibited by ultraviolet rays is a direct effect of this radiant energy, and does not depend upon the formation of a definite, material something known as a vitamin. It may be possible that the sterols of the cells have the faculty of storing up this energy and slowly liberating it under favorable circumstances, thus carrying the effect to parts remote from the cells actually exposed. Be that as it may, we know that the mineral metabolism is favorably affected by the rays, and inasmuch as the other methods of accomplishing it all come back to the effect of the rays upon the sterols of the cells, it seems logical to irradiate the patient himself, depending upon the cholesterol of the skin cells to become activated and furnish that force which will cause the mineral contents of the blood to change from a negative to a positive balance.

Here, again, I believe that both general and local irradiation is indicated. There is suffi-

cient clinical evidence to warrant the belief that a series of ultraviolet ray treatments of bones that have become osteoporotic will cause a deposition of minerals therein. Therefore, the treatment should consist of both general and local irradiations.

The fact that these rays penetrate much deeper than was formerly supposed has been shown by Macht, Anderson and Bell,² and this probably accounts for some local results that formerly we could not explain.

In a former paper³ I have described the technic of treating periodontal diseases with these rays, to which you are referred if interested in that phase of the subject. In that same paper I give the results of researches on dosage and the manner of calculating the dose.

Briefly stated, before any intelligent calculation of dosage can be made the efficiency of the particular generator in use must be established as well as the efficiency of each applicator. Then the average erythema dose with each combination of generator and applicator must be found, voltage, temperature and amperage being constant.

When this information is at hand it remains to find the tolerance of the patient, and determine the degree of erythema desirable to produce. The dose is then figured in volt-seconds in the case of the water cooled generator. When using the air cooled generator the dose is figured in volt-minute-distance. This matter of dosage is exceedingly important and you are referred to the article mentioned for a detailed description of it.

The benefits resulting from intelligent use of ultraviolet rays in the treatment of periodontal diseases are such that I should not want to be without this means of treatment. It is a valuable adjunct but not a panacea. It takes its place right alongside of surgical, medical, and dietetic procedures. All have their place and one will not take the place of the others. Furthermore, like other forces for good, it is not without danger in the hands of the unskilled.

While this means of treatment is valuable in the hands of those who will devote sufficient thought to it to use it intelligently, and may I say conscientiously, there is great danger of it being commercialized. In fact this is even now being done by some to the extent of foisting the treatments on every patient

who will submit to it, the motive of such operators being purely ulterior.

Then again, too often the doctor, who otherwise is sincere in what he does, does not fully realize that to accomplish the best results requires much and careful study of the subject, and turns the patient over to a technician or office girl merely with the instructions to "give an ultraviolet ray treatment." I am sure that those who have given the subject the most thought will agree that the intelligent use of this means of treatment requires as careful thought as anything we do in our efforts to relieve those who are sick and suffering.

There is still much to learn about the use of radiant energy as a therapeutic agent, if that term is applicable, and it is in the hope of stimulating the use of this means by those who will carefully observe the effects, to the end that we shall learn much more about it than we know at the present time, that this brief study of the subject is submitted.

211-212 Linker Building.

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Discussion

DR. S. WOLLENBERGER: Dr. Rasmussen has presented a scholarly paper. I deplore the fact that the dental profession is not represented here.

Dr. Rasmussen has given us some comparative statements about the biological as well as the pathological processes in the mouth in comparison with other parts of the body. I do not think that is open to discussion at all, and is strictly in accord with what I said a year ago before this society. There are several points which Dr. Rasmussen and I do not agree on. The first point I wish to stress is: We are here to co-operate with the medical profession. Let's work together! I want to cooperate with my medical friends. There is plenty for both of us to do in our respective fields.

I do not believe, from my limited experience, where we have superior destruction of the alveolar process that by irradiation alone can we build up that bone. We have other means in connection with irradiation that are perhaps a little bit better. Maybe the doctor's experience has been better than mine. He especially refers to almost any irritating source

in the mouth. Whenever I have had loose teeth to cope with and destruction of the alveolar bodies, I did not attempt to irradiate, because, as the doctor mentions, the very act of closing the jaw is another act of irritation. I have had no results in that at all, except in completely ligating and splitting of the teeth, and my results have not been very favorable except in a few cases.

The short waves have a very stimulating effect in the mouth. They are more bactericidal than stimulating and, for that reason, I do not believe they are indicated.

The doctor mentions the different burners. I fully agree with him in that and want to stress it a little. Every individual burner in the hands of every man must be an individual case, so must be every patient. There is no harsh and straight rule in regard to minute exposures with the general irradiation. Every case must be handled individually.

I am glad the doctor gave us a word of warning but I do not think he made it quite strong enough. Ultraviolet is in the air today. Everybody speaks of sunshine. It cures everything, and it is being very much maligned at the present time, especially from the dental standpoint, because the dental profession as a class has not taken it up. Why the dental profession is slow in this, I do not know. I do not know where to lay the blame. I am somewhat surprised that the dental colleges in this country have not taken it up in their curriculum.

However, there is a little sunshine. I got notice the other day from the Chicago Dental Society of over three thousand members, who are very progressive and very conservative, that they are now conducting, under the auspices of the society, a study course, and one of them teaches the use of ultraviolet in the treatment of pyorrhea. I think that is a step in the right direction. They have recognized it or they certainly would not permit that course to be given at the present time.

I again want to say that I believe Dr. Rasmussen is to be complimented on the masterly paper he has presented, and I hope to hear more from him.

DR. RASMUSSEN: I want to thank Dr. Wollenberger for his frankness. I am sure I did not mean to leave some of the impressions I fear he got, and that indicates to me that I want to read

my paper over a few more times and re-write it before I present it.

I said nothing about cooperation. I said nothing about who was to use the ultraviolet, whether the one or the other. I did not have time to enter into that. Of course, I believe in cooperation, as I believe I am on record often enough in saying that at both dental and medical meetings. I might say here now that I hope to see the day when the two professions will be united, the training will be identically the same. Then members of my own profession will know more about the general systemic conditions.

Dr. Wollenberger said he did not get any results out of splintering teeth, and so forth. I read my paper very rapidly, I know I did, but if you will take that paper and read it in print, you may be able to read in there some of the things you did not get in my hurried presentation. That paper is cut down considerably from what the original text was. I say in there that it is an adjunct and not a panacea, that it only takes its place as one of the things that we can do. I did not have time to enter into the thorough treatment of any one or any group of diseases, simply the effect of the ultraviolet rays. I am sure I would not want to leave the impression with any of you that you could take a case of periodontal disease and treat it with ultraviolet and expect any results. You just would not get it, but it is a valuable aid.

Inasmuch as we are differing a little bit, I must say I do think the ultraviolet rays are stimulating. I have seen some cases where I think I have stimulated pretty good; at least the patients tell me they have been stimulated pretty well. As to the results, that is another matter. But certainly you can stimulate the tissues to the point of destruction locally, and I take it anything that will destroy the tissues is a stimulant, but it requires very, very good judgment to use; whether we call it a stimulant or anything else matters little. It requires very good judgment to get the proper results.

That comes right back to the thing I mentioned, and Dr. Wollenberger mentioned; that is, that each case must be handled as an individual problem.



SUN CURE FOR TUBERCULOUS CHILDREN *

R. T. ELLISON, M.D.

PHILADELPHIA, PA.

I have chosen the term "Sun Cure" in the title of this paper rather than "Heliotherapy" because "Sun Cure" is a loose, broad term,—a lay term expressing belief in the curative action of the sun. "Heliotherapy," on the other hand, is a technical term and carries with it the idea of wave lengths and definite dosage. Not that I consider this a lay audience in any sense, rather the direct opposite, but I do not feel that the use of natural sunlight with our present knowledge and equipment can be brought under scientific control either as to the question of wave length or dosage. There is one misconception however, in the term "sun cure" that we should bear in mind and I shall say more about that later.

The use of sunlight as an aid in the treatment of disease dates back for many centuries, but it is only during the present century that it has systematically been used in the treatment of tuberculosis. It is to Rollier that we owe the present wave of interest in this form of physiotherapy. Rollier, working in the high Alps, used natural sunlight as an aid in the treatment of the non-pulmonary or surgical forms of tuberculosis, and the remarkable results reported by him are now well known. Let us consider for a moment the various factors in the sun cure as used by Rollier and what part each plays in the resulting benefit to the patient.

Light is an elastic term and for our present-day usage we have stretched it to include those regions of solar radiation that reach above and below the small band which we recognize as visible light. It is to one band of this invisible light, however, that attention has been chiefly turned as the curative agent in all light therapy. We are told that the ultraviolet fraction of sunlight is the only factor of value, and that the purer the source of ultraviolet the greater will be the therapeutic benefit. It is this teaching that has resulted in the development of the concentrated sources of ultraviolet radiation, especially the mercury-vapor quartz burner and the tungsten arc. The high plane to which

these sources have been developed and their relative cheapness and availability has led to their extensive use in all sorts of conditions. It has caused us to concentrate our thoughts and efforts on this band of solar radiation and to disregard more or less the many other factors in sunlight.

"Sun cure" also is a broad term and implies more than the use of only natural ultraviolet radiation. As used by Rollier it includes fresh-air baths to the skin itself and a certain amount of rest, in addition to a well-balanced diet. Of these factors sunlight is the most important, but the fresh air baths are almost as valuable. We must note here certain differences between heliotherapy in the high Alps and in the environs of Philadelphia. First must be considered the relatively high humidity of this part of the country as contrasted with the mountains, and second, in the Alps in winter, while the air temperature may be quite low, the power of the sun is relatively great and the total amount of radiation is greatly increased by the great snow fields. These differences necessitate certain modification of the use of heliotherapy which will be taken up under technic.

Before we go further, it may not be out of place to recall the major effects, both general and local, of heliotherapy. We are all familiar with the effect of the ultraviolet part of the spectrum on the skin itself—the sunburn and subsequent tanning. We should avoid the one and strive for the other, for there is considerable evidence that the ability to develop pigment is a rough indicator of the benefit derived. Other findings that can be attributed to the sunlight are an enrichment of the blood, both in its cellular elements and hemoglobin content, a stimulation of the skin as an important organ of the body, and certain effects on ulcers, sinuses, and other superficial lesions. The latter affections generally show an augmented activity at first, as evidenced by increase in discharge, but this is soon followed by a marked diminution in secretion, and many of them promptly dry up. The cold-air baths have a marked stim-

* Read at the Eighth Annual Meeting, American Congress of Physical Therapy, Chicago, November 4, 1929

ulating effect on metabolism, resulting in a gain in weight through the production of a firm musculature even in spite of disuse. The skin becomes soft, smooth, and velvety. One of the most striking effects of heliotherapy is the change that takes place in the general disposition of these children. It is remarkable to see the disagreeable, fretful, crying child change in a few short weeks of treatment to a happy, laughing, contented individual. In the long, tedious years of enforced rest that many of these children must go through, this change alone is worth the effort.

Practically all these changes are the indirect result of the action of sunlight and fresh air on the skin. We know that light, and especially the ultraviolet portion of the spectrum, penetrates only a short distance into the exposed skin, and therefore can have little if any effect on deep-lying foci of disease. The effect on these deep-lying foci must be an indirect one from the absorption of energy by the skin, and it is easy to understand that the greater area of skin exposed, the greater the amount of energy absorbed. This does not mean that local superficial lesions should not be exposed but rather that, if exposure is limited to such lesions, the more marked benefit from the total body bath is being lost.

As suggested in the beginning, the term "Sun Cure" is misleading and incorrect in one respect: the sun is not a cure for any form of tuberculosis. Short wave length ultraviolet rays are bactericidal to organisms directly exposed to them, but with the exception of lupus the lesions of tuberculosis are all deep-seated. Even the indirect effects of heliotherapy are not specific against tuberculosis, but the use of heliotherapy brings about such a condition of well-being in the body as a whole that it is better able to resist the invading organism and to repair the damages already done. For this reason heliotherapy cannot be used as a substitute for any of the orthodox methods of treating these cases, but rather as a valuable addition that enhances the benefit derived from other procedures. Rest of the part affected, in the strict orthopedic sense, is essential and should be secured in the usual way, avoiding, if possible, the extensive use of plaster which prevents the irradiation of large areas of skin. The use of heliotherapy does not guarantee the recovery of the patient. As in all forms of tuberculosis there are certain cases which

continue to progress unfavorably under the best of care. When the bones and joints have become involved to the extent that a definite diagnosis of tuberculosis can be made, a train of pathologic events, beginning with destruction and ending in repair, has been started that cannot be aborted by any procedure except surgical removal of the diseased part. This train of events, however, can be greatly influenced by heliotherapy and the proportion of cases ending in complete repair greatly increased.

For practically all types of cases it is advisable to begin treatment by the conservative technic laid down by Rollier. This consists of graduated exposures to increasing areas of body surface. The feet only are exposed the first day, front and back, for a definite period, generally three to five minutes. The next day the legs are exposed for the original period and then covered to the feet, which are exposed for an additional period. The following day the thighs are exposed and then in succession the abdomen and thorax. The head is never exposed to the direct rays of the sun. By this method each area begins with a limited exposure which is increased daily by the length of the original exposure. Few reactions will be encountered with this method, even in the most delicate, but the insolation should be interrupted if there is any rise in temperature, headache, dizziness, or malaise following the exposure.

The foregoing technic is for exposure to the sun, but includes the fresh-air baths and takes for granted the fact that the child has already been acclimatized to fresh air. With ambulatory patients who come bundled up in layers of clothes, this acclimatization is accomplished by gradually removing one garment after another until only one layer is left. With bed patients the amount of bed clothes is gradually reduced and the covers are turned back entirely for increasing periods each day, exposing the body to the fresh air. One important factor in the comfort of patients taking heliotherapy is protection from the wind. The body can stand remarkably low air temperatures if it is exposed to the sun and protected from the wind, but the slightest draft is noticeable, and may cause the stopping of the exposure.

It is the general consensus of opinion that for this type of case under discussion, especially the cases of bone and joint involve-

ment, natural "Sun Cure" is the best form of light therapy. But, you say, in the heart of a large city the use of natural sunlight is greatly restricted and patients are continually presenting themselves for "Sun Baths". What are we to do? It is to answer this question that the manufacturers have provided such an endless variety of sources of artificial ultraviolet radiation. In choosing this substitute source of radiant energy an effort should be made to approximate as nearly as possible the energy distribution of the sun. No source of energy at present available entirely satisfies these requirements, but one of the various types of open carbon arcs is the best that can be secured. In using such a source indoors during the winter, all too often the other great factor in heliotherapy, cool, fresh air, is entirely neglected, and the treatment room is hot and stuffy and full of the odors of electrical machinery and perspiring humanity. Half the possible value of treatment is lost under such conditions. An adequate source of radiant energy and a properly ventilated treatment room, while not producing the results obtained in the summer, still is capable of holding any ground gained during the summer and even adding a little to it, as can be seen by the improvement in those cases starting treatment under artificial conditions. I might say here that if a mercury-vapor burner is the only source of ultraviolet available, better results can be obtained by reinforcing it with some source producing visible light and some infrared rays.

Case Reports

Case 1. A child, aged three and a half years, on admission in December, 1925, had been taken to a General Hospital for an abscess of the upper right arm and treated there by the Orthopedic Department for some time. She was discharged to us in an aeroplane plaster dressing. On removing this, there was found to be considerable limitation of motion of the right shoulder and two discharging sinuses on the upper arm. She was given free use of her arm and by June, 1926, the sinuses were healed. She did not "favor" that arm at all in playing and the lesion seemed entirely healed. She was discharged September 30, 1928 and has remained well since. Follow-up examination shows no limitation of motion in the right shoulder and that the humerus is growing normally at the same rate as the left.

Case 2. With an acute onset in June, 1925, extensive rapid destruction of the hip joint ensued. In a hospital for orthopedic cases the head and neck of the femur were resected, followed by a complete breakdown of the operative area, with

hectic fever and great prostration. The patient was sent to us for sun treatment in February, 1926, as the hospital could offer no further hope. The pictures tell the local story. The boy's general condition improved remarkably well. Late in 1927 he was up and about on a brace and crutches. He was discharged April 3, 1928 with the local lesion healed. Follow-up examination shows him to be in excellent general condition, no further activity in his hip.

Case 3. This patient has been treated for eighteen months in a hospital for orthopedic cases. On admission in June, 1925, there was marked emaciation and a paraspinal abscess. After a period of about a year and a half in bed, the patient was gradually gotten up in a brace until, on discharge, in October, 1929, she is up and about all day. Her general condition is satisfactory.

Case 4. A cervical adenitis of eighteen months' duration had been treated in dispensaries by incision and drainage. The condition was advancing and the general condition poor. After eleven months of heliotherapy the scrofulous areas had all healed, there were no palpable glands, and the scars were soft and freely movable. The patient had gained thirty pounds in weight.

Case 5. The patient had had cervical adenitis four years before admission, and the incised glands had all healed. The elbow condition began about two years before admission. On admission in June, 1925, there were multiple sinuses about the left elbow, and the maximum amount of motion can be seen from the first double exposure. After twenty-two months of treatment the elbow had entirely healed, and motion had increased as shown in the second double exposure. This case illustrates the degree of motion which can be restored to involved joints.

Case 6. Multiple involvement of the foot and ankle began about ten years before admission. It healed, but broke down again in September, 1926, and grew so much worse that the patient was told it would have to be amputated if improvement did not soon begin. She had been treated at the seashore for several months. On admission she was also found to have a lesion in the second and third cervical vertebrae for which extension was used. The only addition to treatment in this case was the use of heliotherapy, and this resulted in a most remarkable improvement. In the course of eight months she had gained twenty-five pounds. Both the lesion in the foot and in the spine were quiescent. She was discharged seventeen months after admission, walking on her foot without a limp, her head freely movable, having gained sixty-five pounds.

Discussion

DR. I. HARRISON TUMPEER (Chicago): Dr. Ellison's paper was very satisfactory from every standpoint. He has given some very valuable, practical points such as, for example, the fact that the scars of the scrofulous lesions become under sun treatment very soft and pliable and non-adherent to the underlying tissue.

He also mentioned another thing which isn't stated very often in textbooks, but anyone familiar with these subjects will agree that the very temperament of these children changes with the improvement. Finally, he presented such an overwhelming

amount of x-ray and pictorial evidence, there is no question of the efficacy of the sun cure, so-called, particularly when it stresses the hygienic factors of fresh air and proper clothing.

If the evidence by Dr. Ellison that the sun is such an important element in the cure of tuberculosis is correct, we should say all people should be treated with sun in order to prevent the tuberculous diathesis. The question arises: Are we falling into manners of living which promote tuberculosis spread? It was no accident that the cave dwellers faced their caves to the sun. In the Northern Hemisphere, the caves are usually facing the south and east. It was no accident that the Romans built their baths so that the bathers got the benefit of the sun. The Roman's home had a solarium.

Pediatricians who call upon the wealthy sections of our cities, drive up to the place and find a *porte cochere*. You are met by the footman; and by the time you get in the door the light begins to dim. Instead of having the corridors well lighted, only every other light is lit. The mother welcomes you, and when you leave the Oriental rug that covers the living room you grope your way toward where the child may be. When you come to the room you look around in the dimly lighted place, and little by little you make out a child. You see a little pale form lying there. You take out your thermometer and you wonder where the place may be found for the thermometer. You mutter under your breath, "More light."

That is the condition of affairs today. These people form a very fertile field for tuberculosis. These homes are a sad commentary on the comparative anatomy, let us say, of social structures. That is the field in general.

As far as tuberculosis is concerned, history teaches us that the Indians sunned themselves for rheumatism and tuberculosis.

I just want to mention one case report that will bring out some of the things mentioned by Dr. Ellison. A child three years old with scarlet fever was treated by a gastro-enterologist. The child developed the usual cervical adenitis along the course of the external mastoid muscle. The gastro-enterologist used the scalpel and got a very purulent material. There was a lot of granulation material that prevented the healing of the wound, and he was in danger of losing his patient. The usual tuberculous adenitis was found. With a few exposures to the mercury quartz lamp and some silver to the granulations, the wound healed, but, strikingly enough, as Dr. Ellison pointed out, the child's entire temperament changed. Instead of being a peevish, disagreeable child, within the course of three weeks was very joyous and irrepressible.

This illustrates several things. It illustrates, in the first place, that heliotherapy is good for tuberculous glands. It also illustrates the change in temperament on the part of the child. It may also bring evidence to bear on the belief of some European thinkers that only those cervical glands suppurate that are on the basis of tuberculous diathesis. It also illustrates that no doctor should treat those conditions for which he is not qualified well. Although there is usually vomiting with scarlet fever it is not a gastro-enteric disease.

I should like to ask Dr. Ellison if in Philadelphia

they have taken care of the so-called snow tan.

DR. BENJAMIN GOLDBERG (Chicago.): Dr. Ellison made very little mention in his discussion as to the changes that occur in the body because of exposure to the sunlight. I thought I might possibly make some mention of them and reiterate some of the things he brought out, namely, the fact that it isn't the sun cure alone or exposure to the sun that is the chief essential in the treatment. The fresh air bath, or exposure to the fresh air, is an important factor in that it tends to stimulate the body tonus; the flabby muscles develop a firm redundancy. The general nutritional metabolism of the patient improves. There seems, also, to be an increase in the number of red blood cells and hemoglobin. Whether that is due to the exposure to ultraviolet or whether due to the improvement in the general appetite and the food intake is questionable.

Some of these cases do not show this change in the blood picture. The majority of them, however, do. One wonders how the changes take place in the bone lesion itself. In these bony lesions we do note a deposition of calcium salts which occurs with a greater or less rapidity following exposure to the sun. In spite of this deposition of calcium, we do not find an increased calcium content in the blood. Consequently, there is only one supposition: that due to the changes incidental to an increased dietary régime, there is an increase in the absorption of calcium in the blood along with the other salts, although the blood calcium itself shows no change whatever.

As to Dr. Tumpeer's assertions concerning the tuberculosis situation as it exists in communities and the lack of sunlight, we who live in large communities, particularly in large cities, know that situation very well. Particularly is it prominent, as he mentioned, among our richer individuals. We have more tuberculosis and more under-nutrition, as far as childhood is concerned, on our "Gold Coast" than we have *pro rata* in our congested districts. It is a little more difficult to find, however, because we haven't admission to these better homes.

In an attempt to combat a situation of that type, and in an attempt to give our children who have not the benefit of mass ultraviolet radiation, we developed an apparatus last year which will treat approximately 250 children per hour and give them an intensive dose of ultraviolet, these treatments are administered to youngsters who have not the benefit of ultraviolet in their homes.

The first apparatus was installed in the school for crippled children. In that school there are approximately ninety children with bone tuberculosis. It was felt that these children, brought to the school in busses, taken home in busses, not being allowed out of doors at all, were losing the benefits of the natural elements as far as sunshine and air were concerned, and it was therefore essential to expose them to ultraviolet. Since the introduction of that apparatus, much more improvement has been noticed than under the ordinary therapeutic régime.

There is one thing that should be brought out. In time past, and even at the present time, most of our bone tuberculosis and most of our gland tuberculosis in our large communities is being taken care

of by individuals in general hospitals. These hospitals have no resources—have no place where they can give heliotherapy. Our staff is composed of excellent orthopedic surgeons who unfortunately have very little knowledge as to the value of heliotherapy, or as to its use.

Anybody can pick up a textbook on heliotherapy, one on tuberculosis therapy and learn the Rollier scheme of treatment. In institutions where heliotherapy is used to a large extent it happens not infrequently that there are very few orthopedic surgeons on duty. In a number of instances there are no orthopedic surgeons. It requires the orthopedic surgeon to apply those devices best known and those operative procedures which will serve best in a treatment of these conditions along with the use of other measures, such as dietary, which will aid most in cleaning up these conditions.

DR. F. H. EWERHARDT (St. Louis, Mo.): I should like to know what amperage the doctor uses in his carbon lamps.

DR. OLSON (Battle Creek, Mich.): I should like to say just a word about this excellent paper to which we have all listened with great interest.

It was my pleasure not long ago to visit Rollier in Leysin, and I can see very clearly that the methods used over here are very much the same. The doctor wisely emphasized not only the sunlight but also the rest and the air exposure, especially to the cold air, and he also mentioned the careful diet which, by the way, is really Dr. Hindhades diet, of Copenhagen. Unless an occupation is also encouraged ennui and boredom takes place. Patients who go there, remain from twelve to twenty-four months, and sometimes even longer. It means a great deal to make them happy and contented. This work or occupational therapy acts as a sort of psychotherapy. Of course, orthopedic extension is used when necessary.

I think also the massage or tonic effects of the sun and the cold air were mentioned by the essayist. That was perfectly astonishing to observe at Leysin. I could hardly believe it. If I hadn't examined the patients and felt of the muscles to find them firm and strong, it would have been hard to believe they got that way without being massaged. I didn't realize it at first. I asked Dr. Rollier if he had masseuses and masseurs because I thought there must be some of that kind of treatment going on to account for the wonderful restoration of muscle-tone; but there were none whatever. It had all been done by the sunlight and exposure to the cold air.

When I was in England, I also visited Sir Henry Gauvains at Alton Park. At Alton they don't have the benefit of the high altitude. They don't have the benefit of the stimulating, cold, Swiss air. The altitude in Alton, located in the south of England, could not be more than 100 feet above sea level, yet they obtain very much the same effects.

This is accomplished in spite of lack of sunshine in England by combining the available sunshine in season with that of artificial quartz light during the unfavorable periods. They also put patients out of doors in the fresh air whether there is sunlight or not. They keep them warm. The children don't suffer. They enjoy themselves and seem to be very happy. Indoors, they don't have the high tempera-

ture we are prone to have over here. You might think they would be too cold and uncomfortable. It is largely a matter of habit. I saw patients from two years old up to the seventies. They get accustomed to the lower temperature, and they seem to enjoy it and benefit by it.

The essayist was very conservative in his claims. Dr. Rollier, as some of you know, states that it is a crime to operate on a tubercular joint or bone. The statement is made by him that if the patient isn't actually moribund when brought in he is bound to make a good recovery if given time.

As you may know, he also treats lupus. I saw a woman who had been treated and cured just recently (now a servant in Lausanne) who had been previously under treatment at Copenhagen in the Finsen Institute as well as treated by other means for twenty-five years for a very extensive lupus of the face without any material benefit. She was gradually getting worse. At Leysin she was treated over a year and discharged by Rollier as cured.

Dr. Rollier holds that all exposure of the body to light is superior to the old-fashioned Finsen ray as first originated by Dr. Nels Finsen of Copenhagen, and I am inclined to agree with him judging from what I saw there.

DR. R. T. ELLISON (Philadelphia, Pa.): Dr. Tumpeer spoke of the possibility that we are living in an age or have gotten into a condition of life which promotes tuberculosis, and it may be that the use of sun cure is a means of combating this. That is already a large part of the general campaign against tuberculosis. That is the method used to overcome such an infection in children who are exposed to tuberculosis in their home environment. The preventoria, of course, stress the fresh air and sunlight as well as proper diet.

In regard to the question of snow tan, we have not used that principally because in Philadelphia we don't get snow for a long enough period. Unfortunately, we are so far south that if we have snow for a week we consider the winter a success.

The amperage across the arcs in the carbon lamp is about twenty-five. We have to use a 220 current for those lamps. There are two carbons in a lamp, but we have four lamps. We use the Hoffman lamps which are a little different from the usual carbon arc in that they are enclosed in a quartz chimney. They make their own carbons. They give about the same spectral distribution of energy as the sun. They are made from the burning of gasoline, and the carbon is collected and compressed into sticks.

The doctor from Battle Creek mentioned the question of lupus. He also mentioned the fact that originally the Finsen treatment for lupus was only limited to the direct application of ultraviolet radiation to the lesion itself, and that with that they got very encouraging results. Later on, they added general body baths to the local treatment, and they found their percentage of cures was greatly increased. That fact is applicable not only to lupus but to any tuberculous lesion. You can take tuberculous ankle, elbow, cervical adenitis, or anything of that nature, and expose it to the ultraviolet ray and get benefits; but if you add general body baths and fresh air baths you will double and triple your results.

ULTRAVIOLET RADIATION AND MEDICAL CARE VERSUS SURGERY IN THE TREATMENT OF RENAL TUBERCULOSIS *

ALBERT M. CRANCE, M.D.

GENEVA, N. Y.

During the past few years, the writer has had an opportunity to observe and study a fairly large number of cases of renal tuberculosis. In some, surgery has been done; in others, surgery has not been done. On the other hand, the results in some of our larger clinics have been carefully studied in order to arrive at some definite conclusion in the treatment of this very important subject.

The purpose of this paper therefore is to summarize, or rather to iron-out some of the mysteries in the treatment of this serious and constantly increasing malady. Serious, indeed, is renal tuberculosis, and it is constantly increasing. As to this there is no doubt whatsoever. It must be remembered that the symptoms of kidney tuberculosis, early in the disease, are very mild, and I dare say that over 50 per cent of these cases have gone unrecognized too long, perhaps, because it was so easy to prescribe that wicked and treacherous medicament bearing the name of "cystitis tablet." And it is a treacherous tablet, because it deprives more patients of a diagnosis of urinary pathology than you, individually, might ever realize.

In the first place, do we understand what renal tuberculosis really is? Have we in mind the old text-book picture, namely, that a tuberculous kidney necessarily means that some other focus exists elsewhere in the body, such as the lungs? Indeed, this is a very erroneous belief. We must concede today that renal tuberculosis is a separate and distinct clinical entity.

Let me state a few facts to prove these statements. During the past year I have carefully selected fifteen of the most celebrated tuberculosis sanatoria where lung infections are majored. I have obtained from their directors figures which are indeed astonishing. The question was asked: "In what percentage of your cases of pulmonary tuberculosis do you find symptoms of kidney tuberculosis: such as frequency, pus in the urine, or pain

in the back?" In some it was one-half of one per cent; others one per cent, and rarely was it two per cent. The average was less than one per cent. Now, if renal tuberculosis were a sequela of pulmonary tuberculosis, why should it occur so seldom in these cases, bad enough to require institutional care? The answer is, because renal tuberculosis is a separate chapter in the study of this disease.

My own personal belief is that kidney tuberculosis originates from oral entrance and the most common cause is from raw milk. In a series of carefully taken histories you will find that at least eighty-five per cent of cases have used raw milk extensively, either during work, for lunch or at home as a part of their diets. Unless a herd of cattle is under constant inspection, tubercle bacilli can get into any grade of raw milk. No doubt this statement will arouse active criticism, but the writer will still feel that the majority of cases of kidney tuberculosis originates from this source.

Some argue that it would not reach the kidney from this source. If you have any doubt, swallow some methylene blue and see how quickly it gets to the kidney. It is the logical route, not the most improbable.

What *are* the symptoms of renal tuberculosis? The text-books will refer to frequency of micturition as the usual first symptom. Bear in mind that when frequency occurs there is already bladder involvement, and naturally, a well advanced kidney infection. When frequency occurs, no time is to be lost. There are no definite symptoms of tubercular kidney. The vague symptoms are backache, right or left, and occasionally it simulates lumbago. Also bloody urine on one or two occasions is common. There is sometimes real colic, such as a ureteral colic, which in two cases I can recall were first thought to be ureteral calculus. Symptoms, therefore, may be very puzzling. A diagnosis depends on more than symptoms. Most of these cases are diagnosed by rigid routine urological ex-

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amination. For example, it is the writer's habit to consider all cases with pus in a catheterized urine sample as tuberculosis until proven otherwise.

The Diagnosis

The one positive sign of tuberculosis is to find the tubercle bacillus. All samples obtained from the bladder and ureters should be cultured. If a urine containing pus cells gives a negative culture, this is a very strong presumptive sign that tubercle bacilli may be found. The laboratory technician in this particular field must necessarily be one of skill and training. The finding of tubercle bacilli is necessary, not the finding of acid-fast organisms. After considerable training, the differential diagnosis of the other various acid-fast bacilli is definite. I thoroughly agree with Dr. Walter Kearns of Milwaukee, who, in the August, 1927, *Journal of Radiology*, declared that the microscopic diagnosis was the real method. He further declared that the guinea pig inoculation test would be negative in a certain number, because certain strains of tubercle bacilli will not develop in this animal.

Much has been written on pyelography in the diagnosis of renal tuberculosis. It occasionally happens that we find the disease present by means of pyelogram; however, it should not be done as a means of diagnosis. It is harmful, unnecessary and dangerous in tuberculosis. Also, the function of each kidney must be carefully checked. On these two findings there should be enough evidence for all data without pyelography.

Unilateral or Bilateral?

Kidney tuberculosis, I believe, should be considered potentially a bilateral affection. It most always appears in one side first, and no doubt there are a few cases in which it remains unilateral. These are few, however, in the long run.

I recall one striking case which demonstrates this fact. A young business woman, who had only had symptoms of frequency for six weeks, was examined most thoroughly three years ago. Tubercle bacilli were found in the bladder and left kidney urines. The function on the right side was perfect, and on two check-up examinations there were no pus cells nor organisms from the right side. She underwent a left nephrectomy. She made

a fairly good recovery for about six months. She had a marked recurrence of symptoms.

A second cystoscopy showed many tubercle bacilli coming from the right, and only kidney. She then began a series of ultraviolet radiations, along with cod liver oil, feeding and other treatment. She is now back to work, not cured but much improved.

This leads us up to the subject of treatment, a subject now under world-wide discussion: "Should we or should we not use nephrectomy in the treatment of renal tuberculosis?" If we could consider all cases potentially bilateral, we certainly could end the discussion right now. Again, I believe, from what I have seen in the past, that tuberculosis must be considered bilateral, even though the function is normal, and no pus or organisms can be found in the apparently healthy side.

The question of surgery almost always arises. In many of our large eastern hospitals, no time is wasted in getting out a kidney from which the tubercle bacilli have been found in the urine. In many of these cases the function was probably close to normal. The operation itself makes a good clinic demonstration, but the specimen dish also often demonstrates about a ninety-nine per cent normal kidney. Is the patient better off without it in order to fight the disease, or is he worse off? I think he is worse off, by far.

It was stated above that there were exceptions, most naturally, in so far as surgery is concerned. Occasionally when a kidney is completely obstructed, or in other words when the kidney becomes a bag of pus, a constant source of septic danger, there is only one thing to do: either drain it or remove it. This is even done when there are organisms from the opposite side, unless the function is so low that the surgical risk would be too great. Other than this, I firmly believe that kidney tuberculosis is a medical proposition—that is, if we desire a higher percentage of cures.

It was Sir William Osler who emphasized rest as one of the outstanding remedies for tuberculosis. This is still essential, but rest alone will not be sufficient. The one greatest advance in the treatment of renal tuberculosis is the ultraviolet ray, and by this I mean the pure ultraviolet as obtained only through the quartz tube. We do not desire the infra-red

rays in tuberculosis. I know of one large tuberculosis institution that has discarded the arc lamp because the red rays proved harmful to tuberculous patients. This again brings up the subject of the natural sun's rays, in which, of course, there is so much of infra red. We have not been greatly impressed by the low percentage of cures in kidney tuberculosis as reported by some of our western institutions. The trouble is that the sun varies so much in ultraviolet, which doesn't fit well with tuberculosis. I am most willing to continue with the ultraviolet lamps, in which the results have been very pleasing.

It is difficult to set any standardized method of treating these cases as final. The primary object is to increase the patient's general resistance by rest, by good food, by regular exposures to ultraviolet, at least three times weekly, by constant use of cod liver oil and other tonics to stimulate appetite when necessary.

A few brief case reports will illustrate my purpose:

Case 1. Mrs. O. W. Age 42, admitted Jan. 19, 1929, complaining of painful micturition and frequency associated with considerable backache. There had been bloody urine on several occasions during the past nine weeks. There had been a marked loss of weight, some night sweats and afternoon fever. The urine showed ++++ pus cells; culture negative, but tubercle bacilli in large numbers. Cystoscopy showed tubercular cystitis and the right and left urines both showed many tubercle bacilli. The function was within the normal on each side.

Treatment was begun on February 5th, 1929, by prescribing cod liver oil, and giving three general exposures weekly with ultraviolet (quartz-lamps). It might be important to state that this woman is the mother of six children, and she has continued with her household duties during all the treatment, with the exception of two hours rest in the morning and afternoon. She retires in the evening at eight-thirty. She has been very regular in her treatment. She no longer shows any afternoon fever; the bladder symptoms have entirely gone; there has been a gain of nineteen pounds in her weight; she has good appetite, and the bladder sample of urine does not show any tubercle bacilli, nor any pus cells. She is continuing treatment.

Case 2. Mrs. J. L. Age 33, another case similar in character to that mentioned above, excepting that the organisms were only found in the left kidney specimen. The same treatment was used. She is now free of all symptoms—has gained ten pounds during the first three months of treatment. A fever which ran between 99½ and 100 evenings is now remaining normal.

Case 3. Mr. H. B. Age 35, is an example of marked improvement from the treatment. A year ago he had terrific cystitis, voiding every ten minutes, marked urgency, and even bloody urine at times. The infection was from the right kidney. His left kidney had been operated upon twelve years ago in a southern clinic. The left ureter could not be catheterized or located at cystoscopy. He was rapidly losing weight. He has been very faithful with his treatment, which has constituted rest in bed till noon daily, three exposures weekly to ultraviolet, cod liver oil, and early to bed. He has gained eleven pounds, drives his own car, eats and rests well, and can go all night without getting up to void. There is still some pus in the urine, but he is steadily improving. In fact, a year ago he looked like a hopeless case, in general appearance. Today he looks well.

Case 4. Mrs. I. G., a young lady of only twenty-four, had a tubercular left kidney for nearly two years. The right side was negative. She has completely recovered, and her urine is free from tubercle bacilli. The left kidney function has also improved.

Case 5. Miss G. P., a girl of 20, who less than one year ago had afternoon and evening fever, pain in the right kidney region, pus in the urine and had lost considerable weight. Diagnosis of right renal tuberculosis was made. Following several months of rest and radiation therapy she has gained over twelve pounds; cystoscopic examination was absolutely negative, with the exception that the right kidney function showed a low normal phthalein, showing that there had been some kidney destruction prior to healing.

Such a case as this might have been operated upon, but with what result a few years hence?

Summary

1. Renal tuberculosis is a separate and distinct clinical entity, but not as a rule from other tuberculous foci.

2. Its occurrence in advanced pulmonary tuberculosis is less than one per cent.

3. Renal tuberculosis probably originates from oral entrance.

4. The diagnosis depends on finding the tubercle bacillus.

5. Renal tuberculosis should be considered potentially a bilateral affection.

6. Surgery has a definite place only when a kidney becomes a source of septic danger, such as pyonephrosis. Drainage or removal may be indicated.

7. Tuberculosis of the kidney, whether it is found in one or both sides, is perhaps best treated medically and with ultraviolet radiation.

PHYSIOTHERAPY AS AN ADJUNCT IN THE TREATMENT OF ATROPHIC RHINITIS *

CARL B. SPUTH, M.D.

INDIANAPOLIS, IND.

Atrophic rhinitis is a disease characterized by a sclerotic change in the mucous membrane and the underlying bone, and by the presence of crusts varying in size and shape. The breath is characteristic and quite offensive.

The most frequent causes producing atrophic rhinitis are as follows:

a. An atrophic process resulting from some local disease of the nasal mucous membranes and the nasal accessory sinuses.

b. Pressure necrosis due to distention of the blood-vessels, affecting especially the venous circulation producing a cyanotic engorgement. The underlying cause may be some lesion of the heart, kidneys, liver or lungs which causes a damming back of the venous blood upon the nasal mucous membrane. Elimination of waste products is interfered with, which, acting as irritants in the blood stream, excite an inflammatory reaction.

c. Due to some constitutional disease such as syphilis, tuberculosis, etc. In this type of cases the trophic nervous system is involved and nutrition modified.

The symptoms most generally present are:

- a. Ozena.
- b. Mucous membrane anemia.
- c. Collapse of erectile tissue.
- d. Olfaction often lost.
- e. Crusts distributed over the entire mucous membrane.
- f. Dryness of pharynx.

The treatment is both general and local. The etiology should be determined if possible and treated accordingly.

Many methods for local treatments have been advanced, therefore I shall not mention them here as they are too well known. I do, however, wish to present a treatment which in my hands, has given me by far the best results in cleaning up the crusts and getting rid of the ozena. It is not a cure; however, when the patient is no longer annoyed with the formation of crusts and the fetid odor of

the breath, he may reenter society without embarrassment. For the past two years, I have been using the Quartz Mercury High Frequency electrode for my local treatments and was amazed at the promptness with which the patients I treated responded by this method.

Sonne, of the Finsen Institute, worked out the law that when the temperature of bacteria was raised five degrees above its normal habitat temperature, that the virility of the bacillus was enormously lowered even to the extent of 500 per cent.

Bordier, Professeur Agrege, de la Universite, de Lyon, France, states that the combined heat from the high frequency effleuve and the ultraviolet had remarkable powers of destroying bacteria and reconstructing the tissue.

The Quartz Mercury High Frequency electrode emits both high frequency currents and ultraviolet rays. Most authorities agree that ultraviolet rays are absorbed better in the presence of a hyperemia, and it is for this reason that we apply heat in some form in order to bring a larger quantity of blood into the capillaries before using the ultraviolet. Since these electrodes furnish us with both heat and ultraviolet, I feel that they are the instruments of choice in the treatment of cavities where one wishes this combined effect.

The nasal treatment for atrophic rhinitis is as follows:

1. Cleanse the nostrils by removing all crusts.

2. Apply mercurochrome, 1 per cent, to each nostril and repeat in three minutes.

3. Apply the Quartz Mercury High Frequency electrode, moving it slowly from place to place, covering the entire mucous membrane of the nose. Begin with ten minutes in each nostril and increase it one or two minutes for each successive treatment up to fifteen or twenty minutes.

4. Home treatment is limited only to

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cleansing the nostrils with normal salt solution.

By this form of treatment, a decided improvement is noted at the end of the third treatment.

I wish to report the following cases. In order to determine the effect of the local treatment none of these patients received any medication to use in the nostrils at home.

Case No. 1.—Miss A. D., age 40, stenographer. Miss D. came to me on account of foul breath and large crusts forming in her nostrils. Past history with reference to Lues, tuberculosis, or sinus infections, according to patient's statement was negative. Diagnosis—Atrophic rhinitis. I began treating her with the Quartz Mercury High Frequency as outlined above on March 4, 1927. She came three times a week for two weeks, and twice a week for three weeks. She received twelve treatments and was discharged March 29th. Her home treatment consisted of cleansing the nostrils with warm salt solution. I see her frequently and to this day, she has been free from crusts and offensive breath.

Case No. 3.—Mr. C. S., age 43, farmer. He was referred to me by Dr. B. Spees. Mr. S. presented a picture of perfect health and his only complaint was the formation of crusts in the nose—and a very offensive breath, which had been gradually getting worse. Diagnosis—Atrophic rhinitis. On March 9, 1927, I treated him with a Quartz Mercury High Frequency as outlined above and discharged him May 10, 1927. He reports to me once a month and to date he has been free from crusts and ozena.

Case No. 6.—Miss C. W., age 30, housemaid, referred to me by Dr. C. F. Smith. Miss W. is deaf and dumb and has hereditary Lues. Dr. Smith has had her on an antiluetic treatment for several years. Her nostrils showed a typical picture of advanced atrophic rhinitis. She had large crusts in each nostril, breath was very offensive, the mucous membranes anemic and the turbinates were degenerated. She was about to lose her position on account of the sickening odor of her breath. I began treating her with the Quartz Mercury High Frequency Sept. 13, 1927. Miss W. could only come to the office twice a week, and after three weeks' treatment she was so much improved that her mistress would only permit her to come once a week. She still receives one treatment a week. After the eighth treatment she was free from crusts and at the end of the twelfth treatment one could only detect the odor of her breath at about six inches. In an advanced case of atrophic rhinitis such as Miss W. had, I feel the results we achieved in three months' time by giving treatments only once a week is marvelous.

Case No. 14.—Mr. W. F. B., age 53, contractor. Referred to me by Dr. Strong. Mr. B. has acquired Lues, for which he receives treatments from Dr. Strong. Nasal examination revealed large crusts in

each nostril; turbinates degenerated; mucous membranes anemic, and a perforation in the nasal septum. His breath was typical of these cases and very offensive. Treatments were begun on March 1, 1929. After three treatments he was somewhat better and failed to return until April 1. In spite of the fact that I urged him to take treatments regularly he remained away until May 11. At this time, he received three treatments a week for three weeks, which was followed by one treatment a week for six weeks. At present he reports about once a month. His condition is decidedly improved and I am satisfied that with better cooperation on Mr. B.'s part the crusts could be cleared up entirely.

Sixteen cases of atrophic rhinitis were treated by this method and in each case good results were achieved.

Suite 24 Stokes Bldg.

Discussion

DR. F. L. WAHRER: Practically all my cases of atrophic rhinitis have been complicated with accessory sinus infection. The infected sinuses must be cleaned up if they are at fault, otherwise the results will not be of a lasting nature. I hope you will notice that I am using the word result and not cure. I don't believe I have ever cured a case of atrophic rhinitis.

My technic has been practically the same as Dr. Sputh's, with the exception I have used my high-frequency spark and my ultraviolet separately. I am rather inclined to think that Dr. Sputh's technic is a little bit better than mine, inasmuch as it is a little easier and does not take too much of your time.

There is one thing I do not do: I do not use mercurochrome in the nose following my cleansing solution. As you know, any of the aniline dyes, of which mercurochrome is one, acts as a barrier to the action of your ultraviolet and I feel you would have to prolong the use of your ultraviolet considerably if you were to get the same action as you would get without it.

I am not sure that I get any unusual results in these cases from my ultraviolet. In the future I am going to omit the ultraviolet and note the difference. There is a question in my mind as to whether we get anything other than a surface sterilizing action with the ultraviolet in the nose.

My results have, however, been fairly satisfactory in this way: After three or four treatments, the crusts have practically disappeared, and after about eight or ten treatments, the very offensive odor is almost entirely eliminated. We can keep these cases in that condition if they will come back occasionally for a treatment.

While Dr. Sputh has been careful to tell you he does not get a cure, and I agree with him we do not get a cure, we have done something that is absolutely worth while, inasmuch as we have taken a patient and restored him to society where he can carry on an occupation. Most people with an advanced ozena can hardly hold down a job of any kind. They cannot mingle in society; they are too

offensive, and so I feel that this treatment is worth while, inasmuch as we get at least a cessation of symptoms. The fact that we do not get an absolute cure has no bearing on the treatment.

DR. G. L. BROWN: In my own practice, I have not obtained quite as good a result as the essayist, although I followed practically his technic.

In regard to the use of mercurochrome, I have sometimes used a solution as strong as 5 per cent, and felt I got better results with stronger solutions in the cases where the odor was very bad, but I have found that the patient must return repeatedly and not less than once a week, and sometimes twice a week.

While I make routine Wassermann tests on my ozena cases, I have very seldom found syphilis to be a factor, although textbooks for years have always mentioned syphilis as a cause. I question if syphilis is as much of a factor as formerly supposed. Of course, we no doubt do get cases of ozena in people who have positive Wassermanns.

When we think of the pathology in the ozena cases and the degeneration of the mucosa and sub-mucosa and the fact that we have a deep, wide open space, it does not seem that we can even hope for a cure. However, in one case that I have treated with the method just mentioned and got a very favorable result, so far as the ozena is concerned, I decided to try and use Beck's method of reducing the spaces in the nose. By implanting strips of ivory, I produced a considerable degree of

narrowing on one side, and in that side that patient has had no scabbing, no discharge and no odor. I do not know why the implant of bone, or implant of ivory would not be physiotherapy in a way at that. I merely mention that as being necessary to do in a case which could not be cured at least by physiotherapy.

DR. SPUTH: I wish to thank Dr. Wahrer and Dr. Brown for the discussion. I do not have much to add, except that I agree with Dr. Wahrer. I do not believe that mercurochrome is much good; I mean so far as the action of ultraviolet and high-frequency is concerned. Just a few years ago, you remember, we thought the aniline dyes might help some in the ultraviolet, and that is what started me on the application of mercurochrome before applying the electrode.

Of course, sinuses ought to be cleared up, but I hesitate doing any kind of surgery, especially in the mucous membrane of the nose. I do not place much stress on the Wassermann. Of course, in cases of positive luetic history, time after time your Wassermann report comes back negative and still you are dealing with a syphilitic case. Your laboratory findings are naturally your determining factors.

I have the urethral electrode here. The nasal electrode is made so large at the end that you cannot cover the nose with it entirely. Your urethral electrode is much smaller and you can cover the whole mucous membrane on both sides of the septum.

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A STATISTICAL STUDY OF THE USES OF DIATHERMY AND ACTINIC RAYS IN A GYNECOLOGICAL AND OBSTETRICAL PRACTICE *

JOHN T. SANDERS, M.D.

Member Senior Staff, Obstetrics and Gynecology, Southern Hospital

and

THOMAS B. SELLERS, M.D., F.A.C.S.

Chief of Obstetrics and Gynecology, Southern Baptist Hospital

NEW ORLEANS, LA.

During the past five years we have used diathermy in a large number of chronic pelvic infections. It is no longer a debatable question as to the therapeutic value of diathermy in these cases. Generally speaking, we are confronted with two types of pelvic infection cases: the first, in which the uterus, adnexa, intestines and omentum are matted together, usually following gonorrheal pyosalpingo-oophoritis; the second, a pelvic cellulitis usually caused by post-partal or post-abortual infection. In the first group the patients suffer from menorrhagia and metrorrhagia, pains in the lower abdomen and back, associated with bladder symptoms and constipation. The nervous system is also upset. In the second group there are fewer menstrual disturbances, but more pain and discomfort in the lower abdomen and back, due to scar tissue and old exudate around the nerve trunks and ureters. The backache in both groups may be due to ureteral stricture.

Our technique in treating pelvic cases has been somewhat varied. In our earlier cases one electrode was placed in the vagina and the other over the adnexa. Most recently we have adopted the anterior-posterior technique in placing the electrodes.

There has been much discussion as to how diathermy helps pelvic cases. I believe Gelhorn's¹ explanation is the most feasible. "The heat acts primarily as a stimulant to the vasodilator nerves of the affected zone. As a result, the blood vessels dilate and into these vessels rushes a large wave of fresh arterial blood. This serves, in the first place, to cool the heated tissues and prevent burns, and sec-

ondly, to wash away the waste products of former inflammations. The local metabolism which had been retarded by the existing pathological condition is thereby restored more nearly to normal."

The results obtained from diathermy, like those from many other measures, depend much on the technique and the selection of cases. Only a trained therapist should attempt to treat pelvic infection cases. Acute and sub-acute inflammation is a contra-indication to its use. Diathermy will not only assist in relieving symptoms in chronic pelvic infection, but not infrequently it will obviate surgical interference. This is especially true in the second group (or cases of old pelvic cellulitis). Diathermy has not in any sense replaced the older methods of treatment of pelvic infection, but it has been a most valuable addition to our armamentarium in handling this most difficult gynecological problem. It should never be used on a case where the diagnosis is questionable.

Ultraviolet Light

Henry Laurens² states that "in this therapeutic measure we have a powerful stimulant to general health and in particular of the defensive mechanism of the body against chronic infection."

We have treated 246 gynecological cases with quartz mercury vapor light. We do not believe that light within itself is curative of a gynecological condition; we do, however, believe it to be a most valuable adjunct. In this series of cases the light has been used as an adjunct to our therapy. But other medical measures were also used, such as iron hypodermatically or orally, diet and exercise as indicated. Occasionally in anemic cases the

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light was used as a placebo while a complete study of the case was being made. We want to condemn the pernicious practice of using the actinic rays as a cure-all without making a diagnosis to ascertain the cause of the anemia.

It has been demonstrated that the indiscriminate use of ultraviolet light is capable of doing much harm. Even with small doses, unrecognized, incipient tuberculosis may be stimulated. In giving large doses there is danger of over-radiating the patient, thereby producing nervous symptoms familiar to all, such as a feeling of unrest, vague apprehensiveness and sleeplessness.

Hobart has shown that moderate dosage of ultraviolet rays will increase the hemoglobin and red blood cells, while over-dosage causes a decrease. He also states that with moderate dosage the platelets increase, while with stronger dosage they decrease.

The inexperienced in the use of the artificial actinic rays often ask, "Why use artificial light when the same results can be obtained by exposure to the sunlight?" This is because we cannot always depend on the sun on account of its inaccessibility. In summer the heat rays are very trying to the patient whose condition is below normal level. In winter it is difficult to get proper exposure to sunlight, and at the same time, keep the patient warm.

In the following series we used the standard technique in all cases. After each exposure 1 cc. of arsenite of iron with manganese was given hypodermically. We present the tabulated analysis of 51 cases of menstrual disorders and menopause with secondary anemia:

Total number of cases.....	51
Average number of exposures.....	10
Improved	41
Slightly improved	10
Not improved	0

In all of the above cited cases the hemoglobin showed an increase of from 10 to 25 per cent. A large percentage of the dysmenorrhea cases showed a definite improvement. We believe this was due partly to an increase in the hemoglobin and red blood cells. They all received other attention, such as exercise and stem pessaries, etc. In menorrhagia cases

we are convinced that our percentage of cures and improvement has increased since using the actinic rays, which was probably due to increasing the hemoglobin, erythrocytes, platelets, and the calcium content of the blood. These cases received other treatment, such as glandular extracts and supportive measures.

The menopause patients improved for the same reason as given above. In addition to this, the psychological effect produced by the use of light is of much value to women during this period of life.

Analysis of 86 cases of secondary anemia following major gynecological operations:

Total number of cases.....	86
Average number of exposures.....	12
Improved	76
Slightly improved	10
Not improved	0

Every surgeon has been baffled with the problems of restoring the nervous equilibrium of patients to normal following major operative procedure. They are physically weak, due to inactivity, loss of blood and improper nourishment. This coupled with the mental stress and strain of the operation leaves the patient's nervous system below normal. As shown, in the foregoing table, 88 per cent of these patients showed a marked improvement; 12 per cent showed a slight improvement. This improvement was based on an increase in the patient's hemoglobin, red blood cells, and a clinical improvement in the nervous system.

Analysis of 35 cases of neurosis associated with extensive damage to the birth canal, and with a secondary anemia:

Total number of cases.....	35
Average number exposures.....	11
Improved	32
Slightly improved	3
Not improved	0

Our results from radiation in this group of cases was almost spectacular. As pointed out by Lyons³ pregnant women have a tendency to develop anemia, especially during the third trimester. During the first trimester, many not only develop anemia from insufficient and improper food due to nausea and vomiting, but they lose weight and suffer from general mental depression. The increase in the red blood cell count and hemoglobin is of paramount importance, but we believe that the calcium content of the blood is equally important

as it protects the mother's teeth and furnishes additional calcium for the developing foetus.

Analysis of 48 post-abortion and post-partal cases with secondary anemia:

Total number of cases.....	48
Average number of exposures.....	12
Improved	43
Slightly improved	5
Not improved	0

These cases responded readily, as the table indicates, to light therapy.

Conclusions

It is no longer a debatable question as to the value of diathermy in chronic pelvic infections. It not only assists in relieving symptoms but frequently obviates surgical interference. Actinic rays will increase the red blood cells and hemoglobin and also increase the calcium metabolism of the body. Therefore, it is a powerful stimulant to the general health and the defensive mechanism.

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Discussion

DR. HALDOR CARLSEN (Chicago, Ill.): The essayist should make clear what was considered sec-

ondary anemias in these cases. He speaks, of course, about percentages of increase. One man may consider sixty per cent secondary anemia, another one may consider seventy, and some, perhaps, eighty. In compiling the statistical record we ought to have more definite data on that work. Undoubtedly, perhaps, he has, but has not brought it out in his paper.

In connection with having statistical records, next in value is perhaps control records in association with administering the actinic rays. By keeping a check of food intake and the administration of certain of the lime salts one can at times determine with great accuracy the real value of ultraviolet radiation. As stated in the paper no scientific control was attempted because it was impossible or impractical in private cases. There are some who will consider the data as inconclusive because a repetition of the work in other hands may or may not yield different results. It must be appreciated that it is not always easy to measure your results under ideal control conditions. From a clinical point the work is confirmation of other published reports and for that reason it may be considered as a valuable contribution. In the last analysis the patient is the final judge. The paper is timely.

Question: Will you give us some idea of the doses?

DR. SANDERS: In regard to what is considered secondary anemia, as I said in the beginning, we did not have time to do blood counts on enough cases, but we took hemoglobin estimations on all of them, and we considered those below seventy with the general physical appearance as secondary anemias.

All these patients who had an anemia were on a diet. As to dosage: all patients began at a minute and a half.



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NINTH ANNUAL SESSION, SEPTEMBER 8 TO 12, 1930, ST. LOUIS

EDITORIALS

IMPORTANT ANNOUNCEMENT

With this issue the *Archives* becomes the property of the American Congress of Physical Therapy. It is the gift of Dr. Albert F. Tyler of Omaha, founder of the *Archives* and a pioneer in physical therapeutics. Dr. Tyler has for several years been one of the mainstays of the Congress. As a charter member he contributed much of a constructive nature for the organization; and as one in the ranks, he has always been of assistance in more ways than one toward the upbuilding of the ideals of scientific physical therapy. The beneficent act of presenting the Congress with ownership of its official publication merits the appreciation of every fellow. It is a step forward for the organization to possess outright its own organ. It is a spirit of idealism which prompted Dr. Tyler to aid the advancement of a branch of medicine in which he has been greatly interested.

The transfer of ownership of the *Archives* necessitated the transfer of its publication office. Henceforth, all business matters will be

handled from the executive and editorial offices in Chicago. This concentration of interests permits of improved means of publication and also a program of economy, facts which no doubt were obvious to Dr. Tyler and prompted his move.

Every effort will be made to maintain the high standards which the *Archives* set in the past. In fact, the concentration of interests should easily enable the editor and the publication committee to seek even higher levels. The *Archives* has wonderful prospects. Already one of the leading monthly journals devoted to the special branch—physical therapeutics—it threatens to head the field for all the others. Supervised articles for publication, exclusive use of scientific reports and complete transactions of the annual sessions are some of the many features which will be continued. Several new sections will be inaugurated from time to time. The plan is to continually make the *Archives* more representative of the purposes and ideals of the Congress.

PHYSICAL THERAPY IN ARTHRITIS

Probably in no other condition has physical therapy proven its value so specifically as in the arthritides. From the very beginning of recorded observations,—as far back as the Ancients and as late as contemporary times, medical literature has made favorable reference to the value of some form of physical therapeutics. With the Ancients the treatment of arthritis encompassed the use of hydrotherapy and sun bathing. The popularity of these measures has been attested by the writing of Hippocrates and Galen. That its utilization finally was reduced to the level of a "delightful sensation" by the Romans may or may not have been the cause of its sinking popularity as an important therapeutic agent.

Such a situation may have a modern parallel in the popular rise of indiscriminate artificial sunbathing in our modern home, beauty parlors, clubs and bath houses. And it is a certainty that its decline as a therapeutic agent will be in proportion to its universal adoption as a "delightful sensation" by the lay people.

Fortunately the armamentarium of the modern physician practicing physical therapy has been extended by the newer discoveries in the field of photo-and thermodynamics and electricity. He has adapted, or varied his agencies to the laws of modern physics.

The interpretation of disease has now become more rationalized with the advent of modern methods of analysis—analysis based upon physiologic assays of living material and pathologic changes. The treatment of symptoms has in the greater majority of cases been relegated to the search of the cause, and the treatment is now based upon a classification of this. The laboratory method has replaced the antiquated empirical habit. And modern physical therapeutics is receiving recognition on the proposition that its sources are fundamentally based upon orthodox physical principles, and its results on sound physiologic interpretations. Increasing familiarity has developed better technics and has brought out more sharply the indications of its possibilities and its limitations. The various measures included under the name of physical agents—all have at some period in the history of

modern medicine received marked recognition by virtue of their demonstrated usefulness in the rheumatic states. There was a time when hydrotherapy enjoyed the favor of the medical profession to the extent that it was even adopted by a majority as the therapy *par excellence*. Massage, manipulation and muscle training are again receiving rising recognition by the leaders in our profession. Galvanism and electrical gymnastics are the less popular of our physical measures but, paradoxically, the galvanic current is still a favorite agency of the veterans in the specialty for the relief of pain in chronic joint conditions.

The two measures that have captured the imagination of contemporary medicine are diathermy and ultraviolet radiation. There is probably justification for the partiality shown towards them. These energies contain many physical properties, which upon demonstration, are suggestive of the spectacular. From the beginning they have evoked an usual curiosity in regard to their physiologic possibilities. It is probably due to this unusual situation that the interest of many brilliant investigators became actively focused on the theoretical and practical side of its problem. The past several decades have thus seen unusually large contributions to the literature on the value of these energies. From the very beginning, the appraisal of these measures demonstrated the clinical value of diathermy in arthritis and the helpfulness or even the specificity of ultraviolet baths in certain inflammations and infections of the joint.

In spite of the initial report by d'Arsonval¹ that medical high frequency currents produced merely a disagreeable sensation of heat, early investigators were attracted to its possibilities as a curative agent. Von Zeynek² and his coworkers were the first to direct attention to the value of this agency in joint affections. To demonstrate the deep heating qualities (thermopenetration) of a diathermic current, Zeynek introduced into rabbits cultures of diplococci, subcutaneously, intramuscularly and intra-articularly. Controls infected in the same manner were studied as a check. The infected joint was heated through. The results demonstrated that the temperature of the joint could be raised sufficiently to destroy the bacteria without disturbing the normal function of the part. The

fluid on withdrawal was sterile on culture, while the control showed virulent colonies.

A further proof of the deep heating and bactericidal qualities of diathermy was contributed by Laqueur³. Rabbits injected with *gonococci*, *cholera vibrionen*, *pneumococci*, *staphylo-* and *streptococci* showed in the order enumerated the sterilizing effect of this current. In the pus organism it was found difficult to raise the temperature in the living joint to sufficient heights to sterilize the part. When, however, the animal was killed and the temperature of the joint raised to 60°C., the cultures were then found to be sterile. The results of these investigations are of more than academic interest to the clinician. Sterilization of infection can be produced by diathermy and the deep heating qualities are established beyond doubt.

From a clinical point of view the recorded observations of the pain-allaying qualities of this current have been reported in a manner so consistent and so persistent, and over a long enough period of time to remove them from the realms of speculation. The analgesic qualities of diathermy is an established fact. This applies also to its properties of transforming a passive state of congestion with its concomitant disturbance of the nutrition into a state of active hyperemia with increased cellular oxidation.

In spite of these potential qualities of diathermy in arthritis the clinician has been frequently disappointed in the results obtained. An article by Seybold published elsewhere in this issue contributes some logical reasons for the use of physical therapy in arthritis. This communication offers reasons why failures may take place or how they are to be avoided. Seybold suggests that the most intelligent method of treating the many varieties of joint pathology is on a basis, first, of classification, and second, the selection of the measure best suited to the condition. This emphasis is timely and contains the support of Elsom, the discussor of the paper.

It is not an infrequent occurrence to observe the recommendation of physical measures in certain hopeless types of arthritis by physicians thoroughly well acquainted with the histo-pathologic picture of the case. Degenerative changes may have taken place be-

yond repair, and yet, when physical agents fail to accomplish that which only black magic or a miracle could accomplish, the whole discipline is condemned in one sweep. Not all the blame should be placed at the door of the conservative physician who expects the impossible. The physician who is versed in his physical therapeutics but fails to select his cases for treatment on the basis of their classification deserves to be criticized even more severely than the example cited above. On the classification recommended by Seybold the indications and the limitations will become more intelligent and our results assured of greater success. The treatment of arthritis by physical measures should not be regarded today as a hazardous adventure in therapeutics, for it has been conceded a place amongst the scientific measures of our times.

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2. Von Zeynek, E. and V. Bernd, R. V. Preiss: Vorläufige Mitteilung über Thermopenetration. Munch. med. Wochenschr. 1908, No. 8, Pp. 432.
3. Laqueur, A.: Leitfaden der Diathermiebehandlung. Berlin: S. Karger 1926. "L'application de la thermopenetration." Arch. d'electr. med. No. 293.

THE USE OF INFRA-RED RADIATION IN ACUTE UPPER RESPIRATORY INFECTIONS

There is no ailment which occurs so frequently during the winter months as the "common cold." It is in fact an infection of the upper respiratory tract, self-limited in most instances, but continuous in others to the point of complications. The popularly known sinus disease is an extension of the original intranasal infection—the coryza or head cold usually attributed to a variety of causes. Leonard Hill¹ states in his little volume that colds belong to a class of infective diseases which do not provoke any prolonged immunity and that there is no means of prevention other than that of general and individual attention to those things which promote good health.

The remedies which have been suggested for the treatment of upper respiratory infections are so numerous that no attempt is made

to detail them. Isolation, vaccination, specific drugs comprise but a few of the methods still in vogue. Not so long ago the chlorin treatment created considerable enthusiasm among physicians, only to be relegated to the discard after a thorough clinical trial. Wells² calls attention to the fact that one may be hardened against colds and recommends exercise, air and water as the agents which may be utilized to produce this effect. This same writer emphasizes that treatment which is proper to one stage of the affection may be entirely inappropriate to another. In the early stage of a head cold, attention should be directed to the constitutional symptoms. Local treatment is usually of little avail because of the highly sensitive state of the nasal mucous membranes. Wells aptly classifies the stages of an acute rhinitis, during the first stage of which he cautions against local treatment in any form. In the second stage, local treatment is permissible, but must be cautiously used, while in the third stage, a more energetic scheme of local treatment is in order.

Probably one of the most important advances in the therapy of the second and third stages of an acute rhinitis is the employment of radiant heat-light or infra-red radiation. Several rhinologists have recently reported on the value of this kind of treatment. Hollender³ remarks in one of his articles, that in the therapy of acute coryza after the usual treatment providing increased ventilation and drainage, the application of radiant energy has acted as a valuable aid. Hayes⁴ likewise evaluates local heat as an aid in acute rhinitis and acute sinusitis.

Of special interest is a recent article by Vaile,⁵ who treated head colds in children by means of suction and infra-red radiation. This was utilized for palliation. The heat was supplied by means of the infra-red lamp. The time exposure and the distance depended upon the individual tolerance. When no improvement followed from two to three weeks of palliative treatment, resort was had to surgical measures. In all infants and in the majority of young children it was not necessary to resort to these. Suction and the infra-red radiation were sufficient to effect a cure in nearly all cases.

"There are practically no contraindications

for the application of either the luminous rays or infra-red in acute upper respiratory infections. It is extremely important, however, that their continued application be not depended upon to do what surgery or other measures usually accomplish promptly. They are not substitutes for other methods of treatment, but the sources of the energy are improved means of heat generation by which such physical force can be applied in a simple manner and with maximum effects."

¹ Hill, Leonard, M.B., F.R.S. and Clement, Mark. *Common Colds—Causes and Preventive Measures*. London: William Heineman (Medical Books) Ltd. 1929.

² Wells, Walter A., A.M., M.D., F.A.C.S. *The Common Head Cold and its Complications*. New York. The Macmillan Company. 1929.

³ Hollender, A. R. *Rational Uses of Physical Energies in Oto-Rhino-Laryngology*. American Journal of Surgery, February, 1930.

⁴ Hayes, Harold, M.D., F.A.C.S. *Physical and Electrotherapy in Otolaryngology*. Archives of Physical Therapy, X-Ray, Radium, March, 1930.

⁵ Vaile, I. R. *Accessory Sinus Disease in Children*. Canadian M. Ass'n Journal, 22:198 (Feb.) 1930.

THERAPEUTIC FEVER PRODUCED BY DIATHERMY

An interesting report on this subject appears in a recent issue of the Southern Medical Journal. Its basis is the therapeutic fever produced by malaria in the treatment of paresis. As King and Cocke¹ point out, there has been a definite trend toward the opinion that fever is one of the major defensive measures of the body against invading organisms. Various fever-producing substances have been employed in the treatment of paresis, experimentally and clinically, but malarial inoculation is still the form of febrile therapy most widely used. These authors have reviewed the literature and quote authoritative reports on this subject which seem to indicate a sound rationale for fever treatment. They agree that although malaria has been our most satisfactory therapeutic measure in paresis, it has many dangers and disadvantages. In support of this claim, the report of Bahr and Buetsch² is quoted. These workers treated 100 patients of whom five died during the malarial infection and 18 died following malarial prooxysms. Evidently these authors

fully appreciated the fact that this form of treatment is not without danger even in selected cases. Similar reports³ are contained in the literature emphasizing the mortality factor as a decided disadvantage to the malarial treatment. Other disadvantages are also noted, all of which suggests the advisability of determining some other means of producing therapeutic fever without the hazard of giving the patient a disease that is difficult to cure and which sometimes does irreparable harm to the body.

Without repeating in detail the statements of King and Cocke, suffice it to say that their experimental work merits much consideration. The interested reader can easily refer to the original article, which is worth perusing. In brief, a method is presented of producing any desired temperature by means of an electrical current, avoiding many of the dangers and disadvantages which seem to be inherent in the elevation of temperature by malaria and foreign proteins. "This procedure affords a means of determining the therapeutic value of high temperature without collateral infections." By means of temperature curves the authors demonstrate the accuracy and range of this method of fever production. They believe that the reactions to this fever are very similar to those produced by disease and the results obtained with malaria, and that this form of treatment will be useful in any of the many diseases where pyretotherapy is indicated. This chief advantages of this form of pyretotherapy are enumerated.

It is hoped that this piece of research will stimulate further investigation along the same lines. The field for research with diathermic therapy has hardly been scratched. The occasional report on some interesting new phase is indeed inspiring to us, and, we trust, stimulating to physicians and laboratory workers who are seeking to expand our present knowledge of a subject still too limited to permit accurate recitation.

¹ King, J. Cash, and Cocke, Edwin W. Therapeutic Fever Produced by Diathermy with Special Reference to its Application in the treatment of Paresis. Southern M. J., March, 1930.

² Bahr, Max A. and Buetsch, W. L. Two Years Experience with the Malarial Treatment of General Paralysis in State Institutions; Clinical Serological and Autopsy Observations in 100 Cases. Am. J. Psychiatry, March, 1928.

³ Solomon, H. C. Oxford Med., Vol. 6, Part 2, p. 616.

A UNIT OF INTENSITY FOR ULTRAVIOLET LIGHT *

G. W. C. KAYE, O.B.E., M.A., D.Sc.

The growing need for a unit of intensity in ultraviolet therapy was one of the principal subjects of discussion at the first International Congress of Actinology which was held in Paris on July 22-27, under the patronage of the President of the French Republic and the Presidency of Prof. d'Arsonval.

This was the main subject before the physics section (under the chairmanship of Prof. Fabry), papers by Saidman (Paris), Coblenz (Bureau of Standards, Washington), Keller (Fribourg), and Strauss (Vienna) being read and discussed at some length. The following summarizes the present position:—

A physical unit of radiation-intensity is precisely specifiable in C.G.S. units, but its practical realization with the necessary refinements is only possible in suitably equipped physical laboratories. The questions of practical methods of measuring dosage in actinotherapy, the choice and specification of a satisfactory biological dose, the correlation of the physical unit with the biological dose, are further problems which bring other difficulties in their train, such as biological selectiveness to wave-length. The commonly accepted biological dose is based upon erythema or pigmentation of the skin, although incidentally it would appear that curative effects may result from a radiation too feeble to produce an erythema. The spectral erythemic response curve of the average skin, using a constant energy stimulus of different wave-lengths, has been investigated by Hausser and Vahle (1921) and others. It appears that the maximum erythemic response is located near the wave-length 3,000 Å. and that it is possible to assign to each wave-length in the ultraviolet an activity coefficient relative to the 3,000 wave-length. Questions of idiosyncrasy and the influence of intensity on length of exposure are among the difficulties that arise in this matter which, however, properly belong to a biological domain.

As already indicated, from a physical point of view a given radiation is completely defined if we know its spectral distribution curve of energy. This is not, however, a sim-

* Reprinted from the *British Journal of Radiology*, Vol. II, No. 23, November, 1929.

ple matter to determine, involving as it does quartz monochromators and sensitive non-selective radiometers (e. g., thermopiles with suitable filters) calibrated by radiation standards such as the seasoned carbon filament lamps to which Coblenz has given much attention at the Bureau of Standards. By such means radiation-intensities may be determined in C.G.S. units (energy per unit area per unit time) for each of the wave-lengths present in a heterogeneous beam of ultraviolet light. It is not possible, however, in practice to isolate completely the band of wave-lengths of medical interest, and, moreover, uncertainties and irregularities inherent in the filters at present available for this purpose have to be taken into account.

But a procedure such as the above is clearly outside the province of the medical worker. Coblenz accordingly submitted a simplified proposal to the Congress that, in the present state of development of the art, it would suffice merely to integrate the effects of the several wave-lengths in a beam of ultraviolet radiation by the use of a calibrated thermopile (and filter). He suggested that the name *Finsen* (F) should be given to the unit of average intensity so measured, which would be defined as:—

1 milligramme calorie per mm.² per minute.

If such a unit of dosage were adopted, all that would remain would be to measure the intensity of a particular radiation in F units and to note the time required to produce a given biological effect.

In practice, a variety of actinometers or ultra-violet dosimeters have come into use, for example:—

(1) Chemical processes such as the blackening of photographic paper, the blackening of lithopone, the oxidation of acetone and the resultant bleaching action on methylene-blue,

the change of color (from white to yellow) of pastilles of diphenylamine and choral formamide.

(2) Cadmium photo-electric cells, suitably screened. All these are selective in action as regards wave-length, and despite certain defects, are preferred to the thermopile by medical workers partly because of their relative simplicity and sensitiveness, and partly because they tend by reason of their selectiveness to approximate to the behavior of the skin.

The calibration of such selective meters in absolute units would necessitate an intercomparison for each source of radiation employed, with a non-selective radiometer. In this connection considerable simplification would result if a standard source of ultraviolet radiation could be chosen and specified.

An alternative proposal was submitted by Saidman, who wished to reserve the name *Finsen* for a unit biological dose, defined as being the radiation producing the same effect on the skin (of the normal front forearm) as is produced by a monochromatic beam of wave-length 3,000 Å. with an energy of one erg. As mentioned above, other wave-lengths would have assigned to them activity coefficients based on the skin response data relative to the 3,000 wave-length, which would be adopted as standard.

In the end it was decided to form an International Committee consisting of one medical and one physical representative from each of the various countries represented, with Prof. Fabry as Chairman and Dr. Saidman as Secretary. It was arranged that this Committee would work by correspondence, and would endeavor to reach a basis of agreement by the time of the second International Congress of Actinology to be held in 1932, probably in Copenhagen.



PHYSICAL THERAPY CLINICS

LOW TENSION CURRENTS—INDICATIONS AND TECHNIC *

J. U. GIESEY, M. D.

SALT LAKE CITY, UTAH

In considering the indications and technic of Low Tension Currents we should remember that we are actually considering the applications of a parent current from which all other type currents today employed in a medical sense, are derived. Forty years ago, Massey and others first brought to the front the use of the Direct or Galvanic current as a therapeutic agent.

The Low Tension currents are direct currents, *per se*, so modified as to give a wider treatment availability than could otherwise be derived. In the main we depend on polar characteristics for effects. Every time we use a negative active pole, we know that the hydrogen ion will be attracted to it, and an alkaline, tissue softening, circulation increasing effect will be set up in the tissue zone to which it is applied. And, conversely, we know that the hydroxyl ion will flow to the positive pole and produce an acid—vaso-constricting, tissue firming, a hardening effect, within its effective field.

But there are times when no polarity effect is desired, a non-chemical action, which by the response of the tissues to the current flow, gives the effect of a cellular massage. This is the sinusoidal modification of the parent current, which by its constant and regulated reversal, changes the polarity with a frequency sufficient to cause no more than a shuffling of the tissue elements, to a degree below that required for the production of definite polar effects.

Or—if we desire polar effect with an action not greatly different from that of passive exercise, we can interrupt or sinusoidalize the direct current.

Another use of the low tension current is for ionization of certain chemical and metal-

lic substances. Literally, when a current passes through a conducting substance, ionization always occurs, because when a current is so passed, certain changes in the molecular and atomic elements of the conducting substance are produced. Either electrons are added to certain atoms or they are shaken off. An ion may, therefore, be defined as an "electronically unbalanced atom."

The field of application of low tension currents is quite large. We may soften tissues in which fibrotic changes have occurred. Inflammatory areas may be constricted and their chemical reaction changed. The nutrition of a part may be increased by improving the circulation, increasing cellular supply and promoting the removal of tissue waste. Likewise drainage may be promoted and abnormal tissue destroyed *in situ*. Hemorrhage may be checked by constriction of circulation. We may bring about the toning effect of tissue massage and passive exercise, and through it, a return of muscular and nerve tonus. Thus the condition of atrophic and flaccid parts is improved. We may ionize into the tissues chemicals, which will combine with the cellular substance, and by a process of slow absorption produce not only a local disease-inhibiting result, but in addition, a slow systemic effect. By all these means we may do much to re-establish the balance of normal health.

Indications

The Low Tension Current is a wonderful tonic, a general stimulant—a veritable house-cleaner if you like. Passed through the body it brings a sense of well being not unlike that of a fresh and cooling breeze. An increased general tonus results as the current clears the cells of their accumulated waste, and as a result the entire physical engine is speeded up.

In joint conditions, post traumatic or of an

* Clinic conducted at the eighth annual meeting, American Congress of Physical Therapy at Chicago, November 8, 1929.

arthritic nature low tension currents find a wide field of usefulness, either alone, or plus its ionizing effects. In nasal conditions, ionization is a valuable aid. In chronic ear infections, ionization has given good results in selected cases. In any infected sinus tract or fistula, unless a foreign body such as a sequestrum is present, it may be looked to for curative results. As an illustration, many cases of chronic empyema can be brought to a permanent cure by ionization carefully and properly applied. In fissures, particularly of the anus, nothing is better than the use of a metallic zinc electrode. A moment ago I spoke of post-traumatic joint conditions. I refer particularly to fibrous ankylosis. The negative pole relieves many of these cases. The ankylosis is broken up and function of the part restored. This is also frequently true of any scar—such as follows injuries or burns. The scar may be softened under the negative pole, plus chlorine ionization from a sodium chloride solution. The painful and disfiguring effects are greatly relieved. Magnesium ionization will eradicate multiple warts such as we sometimes find on the hands of children.

In the treatment of small neoplasms, either the negative or the positive pole may be used with the understanding that the former will give a soft and the latter a hard eschar. The same applies to hemorrhoids. In the larger hemorrhoid the positive pole is the one of choice. In the small or marginal type either pole may be used. In speaking of neoplasms, one should not neglect hyperplastic changes of the thyroid—I mean the simple hyperplasias of course—the so-called “goiter of adolescence” or the post partum type in women. The use of the low tension current may be expected to give favorable results. The positive pole is placed directly over the gland.

In abdominal conditions, referring particularly to post-operative adhesions, or in constipation of an atonic type with ptosis, the sine wave and the interrupted galvanic will prove effective. Of course there is no more sense in seeking to clear up a constipation resulting from a chronic appendicitis or some other such definite pathology with low tension currents, than there is with any other known

means except the knife. It is the functional or reflex type that we must hope to treat in this manner with any great prospect of success. In colitis we will also find it a valuable adjuvant. It must be emphasized that in practically all these conditions, these physical aids should be combined with other known measures of benefit.

In the female pelvis low tension currents find one of their widest fields of usefulness. In ammenorrhoea much can be done by restoring normal circulatory conditions and improving local nutrition, at the same time giving attention to the general systemic condition. In dysmenorrhoea, especially of the virgin uterus, negative galvanism carried up to the internal os, with its effect on the nerve collar at that point, will give gratifying relief. In uterine displacements, largely the result of lost local tone, much can be done to improve this state. In subinvolution also, the results are sometimes favorable. The direct positive pole and a slow sine wave are employed. In endocervicitis, ionization of copper, zinc, or mercury is effective. In old pelvic post-inflammatory conditions, negative galvanism combined with diathermy will soften and clear the tissues of fibrotic changes and restore comfort and a near approach to normal in many patients afflicted with these changes. In cervical erosions, a silver stem and cup electrode applied to the cervix will cause the eroded tissues to heal. In menorrhagia of local origin, galvanism plus general medication, will improve the depleted body tone. In fibromata the use of the carbon ball electrode with a positive current has often proved invaluable in limiting the growth of the mass.

In dermatology low tension currents may be used. I have already mentioned warts. The same is true of moles. In indolent ulcers, zinc ionization will clear and invigorate the surface. In boils it is very easy to insert a small zinc wire electrode and destroy the central nidus of infection, with the positive current. In acne vulgaris the same thing may be accomplished by ionizing zinc iodide from a solution used for soaking the pads over which the electrode is applied.

In the neurological field these currents merit application. In facial paralysis of either a traumatic, idiopathic, so called, or

true Bell type, the low tension current, with possibly faradism in sequence or combined, offers a means worthy of trial. In the late stages of infantile paralysis we may also hope for a degree of improvement not to be obtained otherwise. Low tension wave currents are especially useful for the stimulation of nerve and muscle function. Here again, however, the current must be smooth and of a reversing polar type. Such surges have a very pronounced effect, activate the emunctories, increase oxidation and exercise the muscle elements as no other known agency will. For diagnostic use these currents are also helpful. Both direct and faradic currents are used. But response to the direct current may be expected after all response to the faradic is lost, and it is this current which is, therefore, used in testing for both nerve and muscle degeneration. In the neuralgias, the painful tics, and neuritis, the low tension currents will also be found of definite service.

In Urology we have still another field for their employment. In urethral stricture negative electrolysis by means of a series of graduated sound electrodes will break down the stricture. For urethral fistula in any accessible location positive pole zinc ionization may be expected to promote healing. In infectious cystitis, the electrification with resulting ionization from a solution of bacteria-static nature will bring about a speedy clearing up of the condition provided the condition is local. Here the low tension current should be used in combination with diathermy to insure the best results.

Technic

Briefly the simplest technic has, in my hands, proved the best. There are any number of elaborate electrodes for specific purposes, but only a few are necessary for most purposes.

Generally speaking all one needs is a firm, moist contact, or clean, close contact, in those instances where bare electrodes are the ones of choice. Natural oil on the skin should be removed with alcohol, ether, carbon tetra chloride or soap and water. Then a moist pad is applied and bandaged or otherwise held in *smooth* contact with the wire from which is attached to the machine. For a pad nothing is better than a fairly thick towel well

soaked in water or salt solution. One may use other types of pads such as asbestos, sponges, either natural or made of gauze. But the principle is the same—a fairly thick moist barrier between the surface of application and the actual metallic contact attached to the terminal from your machine. Over such a pad—of a size to cover the area to be treated, one lays a plate of block tin, connects it with the machine and bandages or weights it into position. The indifferent pad is of the same type and similarly arranged. Now turn on your current—*SLOWLY*. If the milli-ampereage is stepped up slowly there is no marked tissue contraction, and hence no painful jerk of which the patient may complain. In a general way this is all there is to it. Yet this is not true from the standpoint of results. The other chief factor is to see that the current is—*AIMED*. By this I mean that the electrodes must be so placed that the current must pass through the region which is to be treated—that it will, if possible, pass naturally in that direction as the easiest way for it to reach the other contact point. Because—like all other forces, electricity follows the line of least resistance, and a lack of aiming may spell failure to get results just as much with a low tension current as with a rifle.

Nasal Diseases

And now let us describe, more specifically, the technic employed in the various affections mentioned earlier in this presentation. Let us consider anterior ethmoiditis, frontal sinusitis and rhinitis. In the first two what happens? Drainage of the frontal sinus is through the ethmoidal tracts. Sinusitis is usually accompanied by supraorbital pain. There is inflammation and swelling of the mucosa with obstruction of the normal air vents. The indication calls for two things: open the natural channels and so establish ventilation and drainage, and—combat any infectious cause. In endeavoring to clear up these cases we use the low tension direct current for two purposes, to check inflammation, and shrink the mucosa. We place a small electrode cut to fit the forehead over the sinus and bandage it on. With a small electrode wrapped in a thin layer of cotton soaked in a 2 per cent solution of zinc sulphate or zinc

iodide, we pass in above the turbinates and as far up into the ethmoidal region as is possible. This electrode we attach to the positive lead from the machine, since it is the positive pole which ionizes zinc, checks inflammation and shrinks tissues. We turn on the current slowly, using two to four ma. for from seven to ten minutes. This is followed by diathermy applied with a small frontal plate and the patient stretched on a condensation cushion so that we include his entire body in a cone of electric force the apex of which is the small focusing frontal electrode. In the purulent cases diathermy is not used. The purpose is to establish drainage. In rhinitis the technic is the same in so far as the current is concerned. The nasal canal is packed with gauze or cotton soaked in the zinc solution and a positive pole is thrust into this packing to complete the circuit, or an electrode wrapped in cotton may be gently thrust into the canal, and once in a satisfactory position, the current is turned on. The tissues shrink and whiten. Treatments are repeated as frequently as indicated by the individual case. In otitis media (chronic type) the ear is filled with the solution through an insulated speculum, or packed with a solution soaked cotton and a wire electrode introduced. Two to three milliamperes for ten minutes is the usual dose. The indifferent electrode should be on the opposite side of the head or immediately in front or behind the affected ear, depending on the depth and direction one seeks to reach.

Facial Nerve

Facial neuralgia will respond to the current directed along the course of the nerve from bony outlet to final distribution, using one stationary and one labile pad with a gentle dosage. Facial paralysis is treated the same way—one contact over the bony outlet or as near to it as possible, and one labile electrode applied over the distribution of the facial nerve, using first a direct current, then a slow, smooth, sine surge, with perhaps some faradism after improvement has started. Or, a blending of the galvanic and the faradic may be used at the same time from a machine constructed to give a mixed current of that type. Treatment should be interrupted at intervals of approximately two weeks after improvement starts, response observed for a few days and treatment again resumed.

Bronchial Affections

In the old peribronchial types of distress following respiratory infections a persistent use of the low tension current combined with other measures such as diathermy and interval x-ray will give great relief, using an active, negative pole over the upper bronchial tract and a large posterior, indifferent electrode, with an ionization of iodine or an iodide from the active pole, for its general systemic effect. In empyemas of chronic type, flood the cavity with a solution of zinc sulphate, or inject it with bismuth paste through the persisting fistulous tract. Then pass the positive current through a small metal electrode inserted in the opening in the chest wall down to but not into the chest cavity. Place the indifferent electrode so as to aim the current through the infected tract. Use a weak current of from four to five ma. for ten minutes and repeat every four or five days.

Intestinal Stasis and Adhesions

In intestinal stasis and ptosis a considerable discussion has resulted as to technic. One group holds that the best results are obtained by nerve supply stimulation, with parallel electrodes placed on either side of the lower dorsal spine. The other group follows the technic of Morse using a pad over the hepatic flexure, later moved to the splenic flexure, and the other pole under the lower spine or in the rectum—the electrode for the latter preferably being a neutral metal or a carbon ball. Personally, I prefer the latter technic. A fairly slow sinusoidal surge is the current of choice, and if the abdominal pads are used, from seven to eight minutes are given at each point of contact selection, with each change marking an advance along the intestinal tube. In addition, if the abdominal wall is flaccid, a rapid sine is used to tone up the relaxed abdominal muscle, with a large posterior receiving pad. By such a technic both the abdominal wall and the unstripped muscle of the gut is exercised and built up. At times additional benefit seems to follow if the sinusoidalized form of the galvanic current is used. Naturally, in connection, diet, the attempt to cultivate a habit time of bowel movement and in some cases mild alkalization should be used. In spastic types in which there is a

largely neurotic cause back of the constipation, diathermy applied to the entire abdomen and a personal coaching of the patient to gain a psychic relaxation will help. Colitis calls for direct galvanism to the colon followed by a very slow and gentle sine wave.

In post-operative adhesions, the direct current with the negative pole over the site of the operative scar and a large diffusing pad on the opposite side of the body, with a current of from fifteen to twenty ma. for twenty minutes, followed by a rapid sine will often give good results.

Pelvic Diseases

Nowhere in all the body is the value of the low tension currents more evident. This is the zone of its use in both gynecology and urology. In erosion of the cervix there is generally a concomitant endocervicitis. The stem, cup electrode is a good one for use here. The stem is inserted in the cervix and the cup brought well up over the cervix itself. Connect the electrode with the positive pole with a large pad over the lower abdomen. Here a few preliminary intra-uterine negative applications should be used. Use twenty m. a. for fifteen to twenty minutes and repeat every third day. In ammenorrhoea—pay attention to the general condition of the patient—then use negative galvanism to the uterus through a carbon ball in the cul-de-sac, or in obstinate cases from an intra-uterine silver electrode, inserted well up to the fundus. Here diathermy is a valuable aid. In dysmenorrhoea, negative endocervical treatment carried up to the internal os should give relief. Use ten to twenty ma. dosage, repeat every other day for a few times and then observe results when the next menstrual period occurs. In menorrhagia—carbon ball positive application of twenty to forty ma. for twenty minutes on alternating days will give the desired results. In subinvolution, the same technic will, if combined with slow sine at the end of the direct application bring the uterus to normal tone and size.

In endocervicitis use the bare copper or zinc electrode, or a bare copper amalgamated with pure mercury. Give twenty to thirty ma. for twenty minutes according to patient's tolerance. In this way you get the effects of a curretage in so far as the destruc-

tion of infected tissues are concerned, but with none of the disabling or confining effects of surgery. After such a treatment the sound on being withdrawn from the canal will frequently bring bits of tissue with it. If so, do not be disturbed as this superficial tissue destruction is desirable, and none of these cases will respond to treatment until these tissues with their contained germ life are destroyed.

In conditions following inflammatory disease of the broad ligaments and uterine adnexa, negative galvanism will soften the fibrotic exudates, and, combined with diathermy, will cause their absorption and removal with a remarkable restoration of the tissues toward normal. Old salphingitis cases will clear up under this technic with an added medium rapid sine to promote a massaging effect. And as a side light—in cases where operative technic, especially for uterine suspensions have been followed by marked discomfort, negative galvanism and sine, with possibly some diathermy, will bring relief without further recourse to the knife.

In fibromata the attack must be intense. Here a carbon ball in the cul-de-sac or a silver intra-uterine electrode within the uterus itself, connected to the positive pole should be employed. The indifferent pad should be large over abdomen or back. Thirty to sixty m. a. should be used, or more if the patient can tolerate. Treat every second or third day for twenty minutes or longer.

In cystitis especially of the female bladder which is so easy to reach, and of the infectious type, not derived from the kidney, we may treat by filling the bladder with a solution of mercurochrome or mercury biniodide, inserting a positive electrode and using the filling solution as a solute, from which ionization is produced. Five ma. for fifteen minutes will accomplish this result. Diathermy added appears to help.

In urinary fistulae a bare zinc electrode is employed. The fistula is threaded with this and four or five ma. of positive current is passed until the fistula wall turns white. A firm compress is strapped or otherwise fastened into position and treatment repeated if necessary in four or five days or possibly a week.

Rectal and Anal Affections

In anal fissure the same technic is used—a bare positive electrode cut from sheet zinc like a dull bladed knife is laid in the fissure tract and the current turned on until the fissure walls turn paper white. Frequently one and rarely more than two applications are required.

In hemorrhoids a needle electrode is inserted into the tumor after it has been injected with procaine, and either the negative or positive current turned on until the tumor mass takes on a grey or brownish color according to which pole is used. In either case the afferent blood supply being destroyed, the tumor mass shrivels away in the course of the succeeding days. Dosage of five to eight m. a. is generally enough.

In indolent ulcers, cover the ulcer with a gauze pad cut to fit the lesion. Apply over this a zinc plate. Moisten the gauze with zinc sulphate solution and give five to ten m. a. for twenty minutes from the positive lead. A few such applications will clean the ulcer and start granulations. Then use ultra-violet light to help epithelization and support the wound with firm dressings between treatments.

In general this covers the field. There may be other indications and technics for the low tension currents, experience alone determining the value of a given method for a given pathologic condition.

PACIFIC PHYSIOTHERAPY ASSOCIATION

Second Annual Meeting, June 13 and 14

The second annual meeting of the Pacific Physiotherapy Association will be held at Hotel Alexandria, Los Angeles, on Friday and Saturday, June 13 and 14, under the presidency of Dr. William W. Worster, of San Gabriel, California. It is the purpose of the officers to make this convention of surpassing interest and value, excelling if possible the first annual meeting, which was held in June, 1929.

Invitations are being extended to men of national importance as well as to the presidents of the Pacific Coast state associations. It is very gratifying that responses have been received from the Surgeon-Generals of the United States Army and Navy, and the Public Health Service. The secretary is encouraged to believe that this meeting will be one

of the outstanding medical events on the Pacific Coast this year.

Surgeon-General Riggs, of the United States Navy, has designated Lieut. Gilbert H. Larson (M.C.), U. S. N., as his personal representative at this meeting. Dr. Larson is in charge of the physical therapy department of the United States Naval Hospital at San Diego. He will read a paper on some phase of physical therapy.

Surgeon-General Ireland, of the United States Army, has appointed Major Clemens W. McMillan to be his personal representative. Surgeon-General Cummings, of the United States Public Health Service, has chosen Surgeon R. H. Heterick as his representative. It is expected that Major McMillan and Dr. Heterick will read papers, the titles of which will be announced later. Dr. Heterick represented the Public Health Service at our last meeting and presented a most interesting paper.

The Western School of Physical Therapy will hold its sessions, under the presidency of Dr. Burton B. Grover, for four days preceding the meeting of the Association, and the staff of lecturers may be depended upon for excellent papers at our sessions.

The technical exhibit will occupy the entire mezzanine floor of the Hotel Alexandria.

The titles that have been announced are: "The Prostate and Its Treatment"—Burton B. Grover, Colorado Springs. "Gynecological Indications for Physical Therapy"—J. E. G. Waddington, Detroit. "A Physical Therapy Department in a State Hospital"—J. C. Elsom, University of Wisconsin. "The Pathology of the Nose in Relation to the Ear and Throat"—Herbert Scholtz, Oakland.

The titles of the papers to be read by Drs. A. David Willmoth, M. W. Kapp, and Clarence S. Cook will be announced later. Dr. Cook's paper will be based on original research work.

With the foregoing papers in mind, we predict a meeting that will be well worth attending. Eastern physicians who read this announcement are cordially invited to make their vacation arrangements for June, including the "Physical Therapy Week in Los Angeles."

HERBERT V. MELLINGER,
Secretary-Treasurer.

CURRENT NEWS AND COMMENT

An interesting report on the combined use of diathermy and oxygen in the treatment of bronchopneumonia, by Pritchard and Tarbell, is contained in the January (1930) issue of the *Bulletin of the Battle Creek Sanitarium and Hospital Clinic*. The authors conclude that the combined use of diathermy and oxygen carefully and judiciously used are a decided therapeutic help in most cases of bronchopneumonia if the treatment is administered as soon as the disease is suspected. The authors believe, furthermore, that, by means of this treatment, it is probable in many instances to abort a definite bronchopneumonia.

Monbrun of Paris, France, writes on the use of surgical diathermy in ophthalmology (*The Eye, Ear, Nose and Throat Monthly*, March, 1930), and states that although high frequency currents have been employed for a long time in medicine and surgery, this recent method of therapy has seemed but little adaptable to, and very dangerous in, ophthalmology. Monbrun remarks: "The results obtained with our instrumentation and our techniques, for more than four years, permit of confirmation that high frequency may enter into the daily practice of the ophthalmologist, for performing with the maximum safety the most minute operations." The indications and methods are fully discussed in this communication.

According to press dispatches, Washington University, St. Louis, will soon have a new \$400,000 building devoted to the study of cancer. It will be known as the Mallinckrodt Institute of Radiology, made possible by a gift of the late Edward Mallinckrodt.

The Third International Congress of Radiology will be held under the Presidency of Dr. A. Bécélère, in Paris in 1931, from July 27 to 31, inclusive. The exhibition will be open on July 26. The official opening of the Congress on July 27 will be at the Sorbonne, where the various meetings will also take place.

An item of interest concerns one of the fellows of the Congress, Dr. Eugene E. Brunson, of Ganges, Michigan. Dr. Brunson, who has been practicing for fifty-five years in the same rural community, was guest of honor, March 7, at the annual Rural Progress Day program held at the Western State Teachers' College. Dr. Brunson is 83 years old, but still quite active. He has been in regular attendance at the annual sessions of the Congress for the past several years.

Fellows of the Congress of Physical Therapy desirous of presenting papers at the annual scientific session, are urged to communicate with the executive secretary at once. The title of the paper and an abstract of fifty words should be submitted not later than June 1, when the preliminary program goes to press.

Announcement has been made regarding a course in physical therapy for technicians at the University of Michigan. The course is to consume one year. Similar work is being offered at the Northwestern University Medical School.

With the transfer of the publication of the Archives to the Chicago office an increased amount of work has been thrust upon a limited clerical force and a few men who are giving much of their time and energy that the Congress may carry on. The fellows can assist by paying annual dues promptly. Expense can be saved by avoiding the necessity of repeated statements. It would appear that this little cooperation is rightfully forthcoming. The added obligation of the Congress in publishing its own monthly official journal makes it essential that subscriptions and dues be remitted without too many reminders.

The department of physical therapy in the Columbia-Presbyterian Medical Center announces a series of three month resident services in physical therapy for graduates in medicine, preferably for those with some training who wish to reside in the hospital and work on the inpatient and outpatient services. The cost of this course will be \$100 a month, and room, board and laundry will be provided. Lectures are given to the medical students weekly and opportunity for any special line of clinical research is available. During the year 1929 the service at the medical center had 3,697 new admissions, with a total of 41,947 visits and 113,985 treatments. The outpatient department covers a floor space of almost 9,000 square feet. Applications for three month appointments which will be vacant each three months beginning April 1, should be made by letter, giving full information as to training, experience in general and special medicine and experience in physical therapy. A personal history should also be given, telling the applicant's religion, age and other general points of information, as well as medical and premedical training. Applications should be forwarded to the director, Dr. Norman E. Titus, 622 West One Hundred and Sixty-Eight Street, New York.

The twelfth annual session of the Western School of Physical Therapy will be held in Los Angeles, California, June 9 to 12, inclusive, in conjunction with the annual meeting of the Pacific Physiotherapy Association, which will have its session on June 13 and 14. The faculty of the school will be practically the same as that of last year: Drs. Burton B. Grover, A. David Willmoth, and J. E. G. Waddington, with the addition of Dr. J. E. Elsom from the University of Wisconsin, and Dr. M. W. Kapp, of San Jose, California, who will illustrate operating technique before the classes. Dr. Burton Baker Grover is president of the school and Dr. Charles Wood Fassett is secretary. With the exception of last year, the sessions of the school have previously been held in Kansas City, Missouri. The fee for the entire course will be the same as last year, fifteen dollars.

The annual fall clinical conference will be held in Kansas City, Missouri, on October 6, 7, 8, 9, and 10, 1930, at the Hotel President.

This conference has grown to be one of the outstanding events of the Middle West, and physicians are looking forward with anticipation to this year's session.

The Kansas City Fall Clinical Conference is a veritable postgraduate course. Clinics are held in all the hospitals of the city, featuring different specialties and affording the physician in attendance an opportunity for bedside experience.

For further information, address Secretary, Kansas City Southwest Clinical Society, 620 Rialto Building, Kansas City, Missouri.

The ninth annual session of the Congress will be conducted as a post-graduate week of physical therapy. Novel plans have been injected into the program which will offer didactic and clinical instruction in practically every branch of physical therapeutics: Light, Heat, Electricity, Massage, Hydrotherapy, Therapeutic Exercise and Occupational Therapy. All sessions will be conducted at the New Hotel Jefferson, St. Louis, and the dates are September 8, 9, 10, 11 and 12. Arrangements are being made also for a series of hospital clinics which will probably be held on the last day of the meeting. As has been the custom in the past, technicians and doctors' non-medical assistants possessing proper credentials, will be admitted to all the sessions.

The 98th annual meeting of the British Medical Association is to be held in Winnipeg on August 26, 27, 28 and 29, this year. The President-elect is Professor W. Harvey-Smith, M.D., and the section of Radiology will be under the presidency of Dr. A. E. Barclay. The Vice-Presidents of the section are: Dr. Malcolm Donaldson, Dr. E. P. Cumberbatch, Dr. J. C. McMillan, and one Canadian representative. All the officers of the section on Radiology are members of the British Institute of Radiology. There will be three sessions of this section: (1) Electrotherapeutics. (2) Diagnosis. (3) Radiotherapy (X-rays and radium). The Honorable Secretaries of the section are: Wm. Roy Ward, M.B., B.S., Radium Institute, Riding House St., London, W. 1., or Frank Andrew Smith, M.D., 419-421 Somerset Block, Winnipeg, Man.

The Fifth International Congress on Physiotherapy will take place at Liege from the 14th-18th September next. Twenty-five countries have already appointed national committees, and the particular subjects of discussion will be "The Role of Physiotherapy in the Treatment of Rheumatic Disorders," "Physiotherapeutic Treatment of the Disorders of the Central Nervous Systems," and the University teaching of Physiotherapy. There will be Sections dealing with Kinestherapy and Physical Education, Radiology, Electrolgy and Thermoherapy, Hydrology, and Actinolgy.

The Second Annual Meeting of the International League against Rheumatism will be held in Liege from the 18th to 20th September, and members of the Fifth International Congress of Physiotherapy will be allowed to take part in all the meetings of the League against Rheumatism.

As regards traveling concessions, the Belgian Government has agreed to allow a reduction of thirty-five per cent on tickets of those attending the Congress, and this also applies to the journey from Dover to Ostend. The French Government has also agreed to a reduction of fifty per cent on all their tickets.

The Eighth Annual Summer Graduate Course and the Colorado Congress of Ophthalmology and Oto-Laryngology will be held in Denver this year from July 29th to August 9th inclusive. All ethical practitioners are eligible for the course and as in the past the class—limited to sixty-five members—will be divided into small sections for the demonstrations and clinics. Daily complimentary lunches, followed by round table discussions will

be continued as a popular feature. Physicians desiring to enroll for this course are urged to send in their applications as early as possible, accompanying same with check for \$50.00, which is the fee of the course.

Among those who will give special courses are:

Dr. J. S. Friedenwald of Baltimore.

Dr. J. F. Barnhill of Indianapolis.

Dr. L. W. Dean of St. Louis.

Dr. Alfred Cowan of Philadelphia.

Dr. Lewis Fisher of Philadelphia.

For further information regarding the course, kindly consult the enclosed folder.

The Congress. Friday, August 1st, is set aside for the Congress for the presentation and discussion of special papers, followed in the afternoon by a motor trip into the Rocky Mountains and a complimentary banquet for the physicians and their families at the Mountain Home of the Motor Club of Colorado.

Applications with checks should be sent to Dr. H. L. Whitaker, Corresponding Secretary-Treasurer, Republic Building, Denver, Colorado, who will also take pleasure in arranging for accommodations or giving you any other information you may desire.

An interesting account on the use of tin in furunculosis of the external canal appears in the November (1929) issue of the *Eye, Ear, Nose and Throat Monthly*. This work was reported upon in 1927 by McAuliffe and more recently by Williams. There seems to be a unanimity of opinion concerning the value of tin ionization in this annoying affection. It is, indeed noteworthy, that the method has not attracted a greater attention, since it merits a trial on the part of physicians generally.



THE STUDENT'S LIBRARY

BOOK REVIEWS

GONORRHEA AND KINDRED AFFECTIONS. GONORRHEA IN THE MALE. CHANCROID AND VERRUCA ACUMENATA. By *George Robertson Livermore, M.D., F.A.C.S.*, and GONORRHEA IN THE FEMALE AND THE INFECTIONS GRANULOMATA. By *Edwin Armin Schumann, A.B., M.D., F.A.C.S.* D. Appleton and Co., New York, 1929.

This book of 243 pages of text material covers in an excellent manner the field designated by the title. The first half of the book, devoted to the male aspects of this disease, is written by a urologist. This section is thorough and it is pleasing to note that the author is abreast with the times in recommending physical agencies where indicated. However, diathermy recommended for gonorrheal arthritis hardly receives sufficient emphasis. The second half of the book was written by a gynecologist. On page 142 there is an error, perhaps unintentional, when the author says: "On its floor just inside the urinary meatus, lie two Skenes' glands, fairly large structures which run from 10 to 20 centimeters along the floor of the urethra." Perhaps this section may be considered not as progressive as the first half in the utilization of physical therapy.

The reviewer is disappointed in noting diathermy almost entirely disregarded in treating urethritis, and arthritis, and surgical diathermy not exploited in certain local lesions. Aside from these minor criticisms this book is an excellent shelf reference for those who are frequently confronted with "gonorrhea and kindred affections" in practice. The authors carefully avoid repetition, thus keeping the book compact. The entire subject is dealt with admirably and the sections are introduced with historical data, laboratory, history taking and the technique of pelvic examination before attacking the clinical aspects of the disease. This book is recommended to both the specialist and the general practitioner.

THE COMMON HEAD COLD AND ITS COMPLICATIONS. By *Walter A. Wells, A.M., M.D., F.A.C.S.*, Prof. of Oto-Laryngology, Georgetown University, Washington, D.C. With an introduction by *Hugh S. Cummings, M.D.*, Surgeon General, United States Public Health Service, New York. The Macmillan Company, 1929.

During the past few years numerous little volumes have appeared on the subject of the "common

cold." While in most instances nothing new has been added to our present knowledge of this affection, each treatise represents a distinctive point of view and calls attention primarily to prevention. This is in accord with modern tendencies in medicine, and, therefore, if for no other reason, these compilations are well worth more than casual perusal.

The surgeon general, in his introduction, exemplifies this spirit, and his statement is better worded than one which could be written by the reviewer. "One would not at first suppose that a book of two hundred odd pages could be profitably written about the trite and depreciated ordinary 'cold.' Yet Dr. Wells has done so, and he has indicated what hygienists believe—that prevention and mitigation of this pawn of diseases is a key step in increasing our national health and efficiency."

The economic aspects of all sickness is today a vital problem of health boards everywhere. This phase is discussed and the author notes the subject in his preface simply to evaluate the importance of the terrific economic loss resulting from this neglected malady.

In the beginning, the anatomy and functions of the respiratory tract are considered. This is followed by a discussion of causes, symptoms and complications. Chapter IX deals with the principles of prevention, and following this, home care and treatment are carefully detailed. Related subjects such as nasal obstruction and mouth breathing come in for due arrangement. The popular topic of tonsils and sinus disease are indeed not neglected. In all, the subject is treated comprehensively and modernly and demonstrates that the ability of the author is one gained by an extensive, intensive and thorough personal experience.

That this is primarily not a book for the physician is attested to in the summary as the author remarks: "The object of this work has been set forth for the benefit of laymen, the best and most recent knowledge of the profession on the subject of the origin and nature of the common cold and its complications—why we catch them, how we can avoid them, and what we can do to get rid of them."

The reviewer recommends the book. It is well written in simplified style and should prove profitable reading to those who are sufficiently interested in one of the universal problems of health of our day.

NEUERE ERFAHRUNGEN AUF DEM GEBIET DER MEDIZINISCHEN ELEKTROSTATISCHLEHRE MIT AUSSCHLUSS DER RONTGENLEHRE. (Newer Advances In the Study of Medical Electricity with Information on X-ray.)

ELEKTROPHYSIK, ELEKTROPHYSIOLOGIE, ELEKTROPATHOLOGIE, ELEKTRODIAGNOSTIK, ELECTROTHERAPIE — As a Supplement to Part I and II.

Under collaboration with Prof. Dr. Arthur Alexander, *Berlin*; Prof. Dr. K. Bangert, *Chemnitz*; Prof. Dr. Oskar Fehr, *Berlin*; Prof. Dr. Franz Groedel, *Bad Nauheim*; Prof. Dr. Gerhard Hoffman, Halle a.d.S.; Dr. C. A. Hoffman, *Berlin*; Prof. Dr. Walter Klestadt, *Breslau*; Primarius Dr. Joseph Kowarschik, *Wien*; Prof. Dr. Franz Kramer, *Berlin*; Prof. Dr. Ludwig Mann, *Breslau*; Privatdozent Dr. Harry Schaffer, *Breslau*; Prof. Erich Schillf, *Berlin*; Prof. Dr. Wilhelm Steinhausen, *Griefswald*.

Edited by Prof. Dr. med. Ludwig Mann, *Breslau*, with assistantship Prof. Dr. Med. Franz Kramer, *Berlin*.

With 258 illustrations; Leipzig: Georg. Thieme, 1928.

Seldom is there a book found on a subject so specialized and surrounded by such a large amount of controversial information that offers such a tremendous wealth of information as does this book. It is therefore not to be wondered that the editor met with such great difficulty in compiling the material and obtaining the cooperation of such a splendid group of associates. This volume as the title indicates has been an attempt to bring down to date the existing information on Electrophysics, physiology, pathology, diagnostics and therapy. It is divided into twenty major headings and each one of them concisely covers an assigned position of Electrotherapy in a most worthy scholarly manner. Hardly less could be expected under the signature of such notable authorities.

An innovation is introduced into these pages by including a complete discussion of electrography of the heart and an interpretation of pathologic forms of electrocardiograms. It is as compact a monograph as is to be found anywhere. And while this may be considered as unusual in discussions of electrotherapy, Professor Mann has shown a great amount of foresight in the deliberate association of this topic with that of other electrical measures in the diagnosis of pathologic states. The cardiologist may question the propriety of such a classification but logically it belongs as a part of physical agencies and should be mastered by those specializing in physical therapeutics.

The bibliography that is appended after each division (they should in truth be considered as monographs), is voluminous and leaves the reader opportunities of suggestive reading that satisfies even the most exacting critic. The book is so well balanced that any student may select special por-

tions for study without feeling that he is sacrificing any part of coherency. For example, the first part of the volume is a scholarly study on electrophysics by Professor Dr. Gerhard Hoffman. A complete discussion of the relationship of the Energetics from the point of view of the modern interpretation of the laws of physics is included. The discussion carries one through the entire realm of radiation physics; from the electron to the radio active elements, their action, their effects and their properties of absorption and ionization. If one is inclined to omit this subject because of a distaste for the mathematics, one can turn to chapters on electrodiagnosis; or to that informative monograph on the Present Status of Electrophysiology by Prof. Dr. Wilhelm Steinhausen, which covers close of 100 pages in this book of unusual size. Or one can turn without the sensation of any gaps to the clinical side and obtain a concise opinion on Treatment with High Frequency currents (d'Arsonvalization and Diathermy) by Josef Kowarschik.

This volume is probably the most comprehensive attempt to include all of the known data on the studies of medical electrotherapy. It has all the markings of scholarship. The material included is presented in a concise and mathematical style with an unusual buffer of a voluminous bibliography. The editor, Prof. Mann, and his associates are to be highly congratulated on their painstaking efforts and their "labor of love." This book is recommended to all in the medical profession who have a reading knowledge of the German language. The publishers should make every effort to have this book translated into the English language, for its success is assured.

NORMAL FACTS IN DIAGNOSIS. *Drs. Harris and Finesilver*, 248 pp., 42 illustrations, some in colors. F. A. Davis Co., Philadelphia. Price \$2.50.

The authors have divided the subject into eleven chapters dealing with the various portions of the normal body.

Under the heading of "pulse" they have included the sphygmographic tracing of the normal pulse but say nothing about the electrocardiographic tracings. Chapters on height and weight are included. There are discussions of the infant and adult skulls, the normal appearance of the ear drum; discussion of the normal eye and the physics of vision including test charts; discussion of the method of testing field of vision, transillumination of the sinuses showing their normal appearance as well as normal x-ray appearance. The other chapters deal with the head, neck, chest, abdomen, extremities, pelvis, sensorimotor examination, laboratory findings and one chapter is devoted to the normal characteristics of senescence.

The book is excellent from a mechanical standpoint and is a valuable reference for teaching physical diagnosis and should be in the hands of every student and physician.

INTERNATIONAL ABSTRACTS

Rational Uses of Physical Energies in Oto-Rhino-Laryngology. A. R. Hollender, M. D.

American Jour. of Surgery, New Series, Vol. VIII, No. 2, Feb. 1930, Pp. 315.

The author gives his views regarding the uses of physical agents in the specialty of oto-rhino-laryngology. The article is a resumé of the subject attempting to rationalize the various physical methods at our command. It is the result of an extended experience in giving thousands of treatments for ear, nose and throat diseases. Emphasis is made on the fact that physical methods are only aids to accepted procedures.

Radiant heat-light and infra-red therapy are discussed with special reference to acute otitis media and acute upper respiratory diseases. Heat as a therapeutic agent is thoroughly evaluated. Facts concerning the physics of ultraviolet energy are enumerated and the status of this agent is elaborated upon in nasal, aural and laryngeal affections.

The galvanic current is employed chiefly for nasal and aural zinc ionization because in these two fields it has produced definite results. Diathermy is the ideal means of thermotherapy and its scope of therapeutic usefulness is both medical and surgical. The various indications for medical and surgical diathermy are suggested, this knowledge having been gained from a voluminous clinical material the past several years. The summary and conclusions are well worth quoting *verbatim*:

1. While physical therapeutics in oto-rhino-laryngology is still more or less experimental, a vast amount of clinical evidence is available to prove the usefulness and rationale of certain physical energies in selected cases which come in the scope of the specialty.

2. Radiant heat-light and infra-red are serviceable in acute otitis media, preoperatively and post-operatively, and in acute upper respiratory infections.

3. Ultraviolet energy has proved beneficial for tuberculosis and lupus of the pharynx, larynx and oral cavities and for some skin affections of the nose and ear.

4. Zinc ionization for selected cases of chronic suppurative otitis media and for intumescent and moderately advanced hypertrophic rhinitis represents a definite advance in the therapy of these diseases.

5. Medical diathermy is of value in acute and chronic forms of frontal and maxillary sinusitis, but must be employed with due regard for underlying factors, principally that of drainage when suppuration is present.

6. Middle-ear deafness is an indication for medical diathermy, especially after the usual methods have failed to bring about improvement. Recent reports by Hilliard and McKenzie appear to

confirm the results reported upon earlier by some foreign and American otologists.

7. Surgical diathermy is unquestionably the agent *par excellence* for the destruction of accessible new growths, whether benign or malignant, providing, however, there is absence of metastatic involvement.

Die Nachbehandlung Accidenteller Wunden. (After-Treatment of Accidental Wounds.) W. Wette.

Fortschritte d. Therapie, 1929, J. g. 5, Nr. 6, (March), p. 182-184.

The "orthopedic treatment of wounds" is of necessity associated with the after-treatment of accidental wounds. It aims at preventing functional trouble in the immediate or distal parts of the wounds. Elementary errors are still committed at present in this respect. Unavoidable temporary and local immobilization should be limited to the utmost, for otherwise various functional difficulties occur e.g., cutaneous scars coalescing with the substratum, tendons with their sheaths, synovial membranes gluing together, the shrinkage of connective tissue and muscles atrophy. To compensate these damages by orthopedic measures at this stage, success of a questionable nature if any, would only be obtainable after a long time. The curative procedure is greatly prolonged. Treatment by exercises should therefore be commenced as soon as possible. It is not possible to lay down general rules as to when this treatment has to be begun, in many cases, however, the principles formerly advocated can unhesitatingly be abandoned. Thus tendinous sutures which were usually immobilized for at least a fortnight, resulted in an extensive limitation of motion and difficult of correction. At the present time the cautious or careful manipulation of similar conditions has given good results within four to five days.

Die Erfolge Der Strahlentherapie Bei Myomen Und Haemorrhagischen Metropathien In Den Jahren 1922-1927. (The Results of Radiotherapy In Myomata and Haemorrhagic Metropathies In the Years 1922-1927.) Richard Geittner.

Fortschr. d. Ther., 1929, Ann. 5, Nr. 9 (May), p. 280-283.

On the basis of the substantial statistical references the author establishes the fact that clinical healing has been obtained in 95.4 per cent of x-rayed myomata. In x-rayed metropathies primary amenorrhoea was obtained in 96.25 per cent, which figure rises to 99.2 per cent of clinical healing by addition of patients, who had become eumenorrhoeic. The results of x-raying are somewhat more unfavorable, amounting to 93.8 per cent of clinical healing for myomata and to 97.7 per cent for metropathies treated by radium. Among the myomata irradiated

by radium there occurred 0.3 per cent of deaths. The method is to be charged with four of these deaths due to infections starting from the uterus and resulting mostly in peritonitis. In some institutes combined roentgen- and radium therapy were given with clinical healing in 87.7 per cent, the other cases being failures.

As regard the indications, there are besides the generally accepted indications for irradiation, such as obesity, albuminuria, constitutional diseases, diabetes, varices also debatable ones, principally the compressive phenomena due to the tumors. The point of view that there is no contra-indication to irradiation in spite of their presence, seems to gain more ground lately. In case of suspicion of malignancy some authors irradiate with the so-called carcinoma and sarcoma doses respectively, whereas others prefer operation. The irradiation of necrotic and submucous myomata is—so far as the author's material is concerned—partly rejected, partly approved.

Accessory Sinus Disease in Children. J. R. Vaile.

Canadian M. Assn. Journal, 22:198, (Feb.), 1930.

Treatment consisted of (a) palliative, and (b) surgical measures. Palliative treatment comprised daily suction and exposures to radiant heat which was supplied by an infra red lamp. The time exposures and distance depended on the individual tolerance. Surgical treatment was used only after two weeks failure with palliative therapy. In all infants and in the majority of young children it was not necessary to resort to this. Suction treatments and radiant heat were sufficient to effect a cure in nearly all cases. The surgical treatment is also described.

Ionized Silver in Treatment of Burns. L. Shillito.

British M. Journal, 2:668, (Oct. 12), 1929. (Abst. *J. A. M. A.*, Nov. 23, 1929).

Shillito's treatment is as follows: Silver nitrate in a 1 to 5 per cent solution is sprayed or painted on the area affected by the burn. An exposure of from one to five minutes is then given with a mercury vapor or tungsten arc lamp at a distance of from 6 to 20 inches, the varying limits being given to allow for the factors of the age of the patient, the size of the burn and the efficiency of the lamp. In the absence of an artificial source of ultraviolet rays an exposure to real sunlight, if it can be obtained, for half an hour produces much the same result. The silver nitrate is ionized by the light and the silver ion combines with the cell proteins—an effect which is practically instantaneous with artificial ultraviolet radiation; the whole area becomes black and dry, and a shiny coagulum is formed, fixing proteins resulting from cell destruction, which, if absorbed, give rise to the toxemia often associated with burns, and at the same time the penetration of the rays to the deeper layers is prevented, thus counteracting any possibility of over-irradiation. Rapid healing is produced in second degree burns and the pain is greatly decreased. No dressings are used and the bedclothes are not allowed to touch the treated area. Another application may be given in from twenty-four to thirty-six hours, if required.

Die Reiztherapie Der Rheumatischen Erkrankungen. (Irritation therapy of rheumatic diseases.) Arnold Zimmer.

Fortschr. d. Ther., 1929, Ann. 5, Nr. 17 and 18 (Sept.), p. 546-531 and 584-593.

The most important remedy of the stimulation therapy in rheumatic affections is yatro-casein which is applied by intramuscular injection. ZIMMER administers six injections averaging 0.3—0.5 c.c. altogether, twice a week. Adjuvant methods of treatment are physical therapy, massage, gymnastics as well as bath treatment.

The most important method of physical treatment is the hot air treatment, for which BIER'S hot air boxes are recommended. It is convenient to undergo this treatment before going to bed in order that heat may be preserved by bed rest. Under the same indications diathermy is also used with good success. High frequency currents, too, are beneficial. Of late paraffin therapy has had some vogue. Paraffin possesses the peculiarity of very small specific heat; it gives off its heat only slowly and can be brought in contact with the skin in high degrees of heat without burning. The French "Ambrine" and the German "Paraffisanum" are to be used as preparations. For the various places of the body India rubber casings have been made, into which the liquid Paraffisanum is poured at from 52 to 54 degrees through a screw-cap. Then the paraffin bandage is covered with a thick woolen wrapper and the pack allowed to lie for from 2 to 4 hours. The paraffin having in the meantime half solidified is then drawn off the skin like a cuff together with the rubber casing. Paraffisanum can be sterilized and employed again as many times as one chooses. In order to slacken contractures the author has found it very expedient to apply an extension splint during the paraffin treatment.

Massage and gymnastics are apt to do as much harm as they can do good. It is therefore necessary to be conversant with the technique and indications.

As to bath therapeutics they represent a sort of proteinotherapy. Serial experiments have shown the individual reaction capacities of the various patients to be the same for both methods of treatment: proteinotherapy and bath therapeutics. Generally it is not expedient to undertake both methods of treatment at the same time; applied at different periods they can supplement one another very efficaciously.

Ueber Die Klimatologische Und Balneologische Behandlung Von Stoffwechselstörungen. (On the climatologic and balneologic treatment of disturbances of metabolism.) Strauss.

Fortschr. d. Therapie, 1929, Ann. 5, Nr. 19, (Oct.), p. 613-615.

Metabolic difficulties are due to disturbances affecting the endocrine glands and the nervous vegetative system. Experience has shown the possibility of obtaining far-reaching effects on the two above mentioned factors by influencing the system. This is accomplished by climatic and balneologic procedures, according to the character of the case. Climate is a complex idea. Its efficient elements are first of all ultraviolet rays, then air pressure, air movement, air temperature and finally, also, certain electric processes. The skin is the chief point of

attack for climatic effects. Stimulations of the nerve endings in the skin can produce an intense influence on the inner organs by way of reflexes. Owing to the influence on vascular nerves a very considerable blood shifting can take place. Late investigations have shown that the skin can be considered as an independent organ of metabolism endowed with the capacity of producing substances by outer irritations apt to influence the metabolism by way of the blood; apparently hormone-like substances are produced at the boundaries between cutis and epidermis. At any rate the skin is to be considered as an important point of attack for obtaining centrotropic effects under the influence of climatic outer irritations.

The skin plays an important part also in bath therapeutics, inasmuch as its contact with the chemical and physical irritants of mineral baths enforces reflex effects and blood shifting, the latter by way of the vasomotor nerves. To a limited extent substances dissolved in the water bath can also be absorbed.

Kombinationsbehandlung Gonorrhöischer Komplikationen Mit Intravenösen Trypaflavininjektionen Und Diathermie. (Combined treatment of gonorrhöic complications by intravenous injections of trypaflavin and diathermy). Kaj Philipsen.

Dermatol. Wochenschr., 1929, Vol. 89, Nr. 48, (Nov.), p. 1916-17.

The local treatment of gonorrhoea by silver salts does not always give satisfactory results. The author therefore tried intravenous trypaflavin instillations and afterwards combined the injections with simultaneous diathermy treatment of the affected part, in order to obtain hyperaemia, hyperlymphism and consequently a more pronounced trypaflavin concentration between the contaminated tissue cells. In one case of gonorrhöic epididymitis of only two hours' standing complete recovery was obtained by one single treatment; the other cases required several treatments (up to 6) without the patient's being confined to bed. Also funiculitis was most favorably influenced by this mode of treatment. Generally, treatment was given as often as it was necessary, sometimes daily, sometimes only once a week. The trypaflavin dose amounted to 2.0-0.4 grams. At the same time local treatment, mostly by albargin and protargol, was continued. The treatment was begun with diathermy. After the organ had been heated well, the injection was made. According to the author's view trypaflavin is fixed in the diathermised organ; this would appear from the fact that following the injection a sensation of increased heat could be found and the well-known universal by-effects were slighter.

The author believes his method which he calls "chemotherapeutic enrichment diathermy" to promise well. By combination with other specific means it would be possible to use it also in other complaints, as for example, in cancer, i.e., the combination of diathermy and roentgentherapy.

Was Leistet Die Roentgenbestrahlung Der Hypophyse Bei Behandlung Klimakterischer Beschwerden? (What are the effects of roentgen ray irradiation of the pituitary gland in the treatment of the disorders of the menopause?) Bianca Steinhard.

Klinische Wochenschr., 1929, Ann. 8, No. 37, (Sept.), Pp. 1717-18.

The author terms the results of x-raying the pituitary gland in climacteric disorders excellent. The favorable effect in climacteric disorders after roentgen castration is especially to be stressed. Technique: both temporal fields were given in one exposure $\frac{1}{3}$ of the skin unit dose each. Also in favorably reacting cases the first irradiation only achieves an improvement of mostly about from 4 to 8 weeks' duration; after a second series the success mostly lasts for from about 4 to 5 months; a permanent success is in the majority of the cases only to be obtained after the third or fourth series. Treatment should therefore not be discontinued prematurely. Vasomotor symptoms as hot flashes, out-breaks of sweat, headache, vertigines are for the most part favorably influenced, which statement, however, cannot be advanced in regard to arthralgias of the menopause. The author points out, finally, that ovarian hormone therapy and bleeding, too, failed in those few cases, in which irradiation had also failed.

The Technique of the Use of Radium in Malignant Diseases of the Upper Air and Food Passages. A. J. Wright.

J. Laryngol. & Otol, 1929, xliv, 365.

As the use of radium in the treatment of malignant diseases of the upper air and food passages presents special problems, the author is trying to evolve a satisfactory technique for each anatomical region.

In the treatment of nasopharyngeal epitheliomata he embeds radium needles in a cast of the nasopharynx and fixes the cast in place by silk threads brought out through the nasal passages. In the pharynx, radium is embedded or attached to a dental plate. In the treatment of laryngeal growths, radium needles are buried after the thyroid and cricoid cartilages have been split and the laryngeal cavity has been opened. In cases of retrocricoid growths, the thyroid, cricoid, and upper rings of the trachea are split, a submucous removal of the posterior plate of the cricoid is done, and radium is placed in the cavity thus formed. In the treatment of lesions of the oesophagus, radium is placed around a Souttar tube which is then covered by a second rubber tube and left in place to allow feeding.

Ein Neuer Apparat Für Blutleere Und Gefäßmassage. (A new apparatus for anaemisation and vessel massage). Ernst Bettmann.

Der Chirurg, 1929, Ann. 1, Nr. 14, (June), p. 647-648.

The apparatus rests on the principles of the compressive action of a motor cycle tire blown up by air. It consists of a strip of band steel about 80

cm. long by 15 cm. wide. On its inside it is supplied with a thin leather coat containing a motor cycle tire which, in communication with the open air by means of a ball valve, can be blown up by a plain bicycle pump. The anemizer is put around the portion of the limb in a single turn and tightened, then closed by a hook and blown up. The opening of the anemizer takes place by an accessory valve placed beside the principal valve and enables quick or slow opening or shutting without removal of the anemizer. The apparatus is chiefly employed for "vessel massage." After the cuff has been put on, the inferior extremity is raised passively by a sand bag so that the venous blood flows off. Now the patient pumps up the cuff to the full, lowers the extremity and by opening the valve, allows the arterial stream to rush in energetically. This procedure is repeated about thirty times, whereby strong and short irritant impacts on the walls of the vessels and particularly on the relaxed tissues of the dilated veins are exerted. The apparatus serves to treat varices, stasis phenomena of the inferior extremity (beware of the application in case of severe varices and atherosclerosis), to hasten the formation of callus, to regulate the stasis in BIER's active hyperaemia (tuberculosis of the bones), and to treat contracted feet, in which the author has sometimes observed softening after the vessel massage.

The apparatus is on sale at the Medizinisches Warenhaus A.G. Berlin, NW 6, Karlstrasse 31.

Ueber Die Wirkung Der Badekuren Und Trinkkuren Mit Solquellen. (On the action of bathing and drinking cures by brine springs). Vogt.

Zeitschr. f. d. ges. phys. Ther., 1929, Vol. 37, Nr. 5, (Sept.), p. 213-218.

Drinking cures are indicated in childhood because of their tonic properties. An important part is further ascribed to them in the treatment of tuberculosis in children, particularly tuberculosis of lymph nodes. Brine baths have proven of value in diseases of the joints, especially those due to alterations of metabolism, gout and rheumatism, nervous and endocrine dyscrasia. One must therefore assume that the tissues undergo organic influence by the brine bath.

The action of brine baths can be only explained on a basis of a strong vegetative effect which has its point of attack in the skin. VOGT urges in this respect that the skin plays a far greater part in general than has been attributed to it so far; it is of importance as an organ of metabolism, chief economy of heat, absorption and discharge of substances and energies; it is also an endocrine organ and is closely related to the vegetative nervous system. The energies with which the brine bath is charged are transmitted to the organs of the system especially by the skin.

Having also been used for drinking cures, brine baths have not failed to benefit cases of hypacidity and intestinal and bilious complaints.

The Antirachitic Action of Activated Ergosterol. A Clinical Study of 133 Cases. C. U. Moore, M.D., F.A.C.P., H. G. Dennis, M.D., and B. I. Phillips, M.D.

Northwest Med., Vol. XXIX, No. 1, Jan., 1930.

Careful clinical records were kept of one hundred and thirty-three cases who were given varying doses of Mead's activated ergosterol over a period of several months. Three of these were pregnant mothers who received six drops daily from the third to the ninth months. All of them reported an unusual sense of well-being during pregnancy and were delivered without difficulty of very well developed and vigorous children. These babies had less craniotabes and costomalacia than the average. We agree with Ertl and Hain that "in pregnant women vitamin D increases the strength and influences favorably the heart, bones, musculature, digestion and elimination."

Forty-three of the cases reported were newborns. The ones on the newborn service at the Multnomah County Hospital, thirty-three in number, who received ten drops of Mead's viosterol daily were noticeably superior to those not receiving it. They were more vigorous, nursed more avidly and regained their birth weight most rapidly.

All of the newborns who were followed for several months developed definite signs of rickets, even though they received six to ten drops of viosterol. When the dosage was increased to from twenty to thirty drops, active rickets rapidly disappeared.

Conclusions

1. In the Pacific Northwest it has been impossible to give enough cod liver oil to prevent or to cure rickets.

2. Pregnant women to whom six drops of Mead's viosterol are administered daily are delivered of unusually well-formed and vigorous infants.

3. Newborns who receive ten drops of this activated ergosterol solution daily from birth are noticeably superior to those not receiving it.

4. Ten drops of viosterol daily is not sufficient to prevent the development of rickets.

5. Active rickets will be cured if twenty to thirty drops of Mead's viosterol be given daily.

6. We have seen no harmful effects from dosages up to fifty drops daily.

7. From this study we recommended dosages as follows:

(a) Pregnant women, 10 to 20 drops from the third to the beginning of the ninth month.

(b) Newborns, 20 drops daily.

(c) Twins and prematures, 30 drops daily.

(d) Active rickets, 20 to 30 drops daily.

(e) Children to and through puberty, 10 to 20 drops daily to prevent and cure postural defects.

Radiotherapie Der Brustdruesenkarzinome. (Radiotherapy of cancers of the mammary gland). Mario Penzio.

Medizinische Welt, 1929, Jg. 3, Nr. 31, (Aug.), p. 1097-98.

Pure irradiation can only be efficient in the very early stages. In most cases, however, early operative interferences followed by post-operative irradiation

tion therapy gives best results. The radiation is to be directed chiefly on the region above the clavicles, viz., on the cervical and axillary regions by a dose found sufficient by calculation to cause the destruction of eventual and theoretical nodular infiltrations. It is more rational to give such irradiations after the operation, since hereby the neoplastic elements perhaps brought into circulation by the operative intervention and accumulated in the net of lymphatics of the cervical or axillary region are affected. The author feels that DESSAUER'S technique with large irradiation fields and homogenized irradiation is the most suitable. In cases quite particularly suspicious of ganglionic infiltration also localized irradiations in massive doses are administered on small fields.

In non irradiable cases, i. e., in cases where severe cachectic conditions, absorption phenomena and advanced insufficiency of the functional performances are associated with the extensive tumor-like diffusion, irradiation causes an exacerbation of the toxic processes which often results in hastening the end.

Weitere Erfahrungen Mit Der Roentgentherapie Bei Psychiatrischen Und Neurologischen Erkrankungen. Vorläufige Mitteilung. (Further experiences with roentgentherapy in psychiatric and neurological diseases. Preliminary note.) M. O. Wiener.

Strahlentherapie, 1929, Vol. 33, p. 380-381.

Report of 4 cases which presented sequelae after encephalitis lethargica and were submitted to roentgentherapy. Three of these four were young individuals, the fourth concerned an adult. The juvenile patients showed chiefly neurological and psychical changes (sleeplessness, insubordination, irritability, salivation, in two cases also convergent paresis and exophthalmus). The adult had subsequently to the encephalitis developed goiter and exophthalmos besides nervous symptoms; his fitness for work was reduced to a great extent. The treatment of all these four cases consisted in irradiation of the skull with small doses. The effect was exceedingly favorable, in that all pathological phenomena disappeared; the adult moreover gained in appreciable weight and the basal metabolism decreased from 104 per cent at the outset of the irradiations to plus 12 per cent. The author promises further detailed communications.

The Electrosurgical Method of Closed Intrapleural Pneumolysis in Artificial Pneumothorax. Ralph C. Matson, M.D.

Arch. Surg., 19:6:1175, Part 2, Dec., 1929.

Intrapleural pneumolysis is an operation of great utility. When it is properly done it is not dangerous and will convert a useless pneumothorax into an efficient one, thus saving the patient from thoracoplasty.

"My experience with the electrosurgical method has given me confidence in this method of cutting adhesions. Control of bleeding is the most dangerous problem and requires thorough knowledge of the character of the currents used. Electrosurgical cutting is accomplished without heat or smoke to

disturb the view. There is a minimum of tissue reaction afterward, and while more complicated and technically more difficult than the galvanocautery method, it is without doubt a notable advance in this branch of surgery, which is being more widely employed."

Intrapleural pneumolysis by the closed method is not a fool-proof procedure with either the galvanocautery or the electrothermic method. The operator must be familiar with the appearance of the pleural cavity and at all times perfectly orientated regarding the nature of tissue to be cut. This training in the use of the thoracoscope in the pleural cavity is just as important to the surgeon or phthisiotherapist as a thorough knowledge of the cystoscopic image is to the urological surgeon. The operator should have experience with pneumothorax and must have surgical training.

Calcium, Schwangerschaft Und Licht. (Calcium, pregnancy and light.) H. Guthmann and Walter Schol.

Strahlenther., 1929, Vol. 33, p. 348-361.

The authors could not control the reduction in calcium content usually associated with the progress of pregnancy by means of ultraviolet rays. They succeeded in observing its increase. This increase in calcium content must be considered prophylactically of extreme importance and benefit. It raises the protective qualities of the patient against subtetany, osteomalacia and eclampsia. It is probable, that the observed favorable action of ultraviolet irradiation on pre-eclamptic women may partly be due to the regulation of the calcium content.

Erysipelas in Infancy and Childhood. John A. Foote, M.D.

Southern M. J., xxiii, 1:29.

The local treatment of erysipelas is so unsatisfactory that other means of limiting or curing the disease have been long sought. One of the newest of the local methods is the use of ultraviolet light and of the roentgen ray. The fact that the medium-short ultraviolet rays will readily kill bacterial colonies on gelatine plates when these colonies have been exposed for short periods has seemed a logical reason for the use of ultraviolet therapy. The results of such treatment as shown in published statistics do not warrant belief in its specificity, although Patou and others have reported beneficial results from roentgen ray therapy. Non-specific protein therapy, using injections of milk and horse serum has also been used by a number of investigators. However, in our hands the use of polyvalent streptococcus sera in the past has not been attended with the same degree of success as has followed the use of the more recent specific serum, and this discussion will not attempt to consider non-specific protein therapy.

Die Ultravioletten Strahlen Als Hilfsmittel In Der Behandlung Der Gallensteine. (Ultraviolet rays as an adjuvant in treatment of biliary calculi.) Arnold Lorand.

Med. Klin., 1929, Ann. 25, p. 151.

One of the most important remedies for relieving

pain, in cholelithiasis because of the associated cholecystitis, is the application of local heat in the gall bladder region. LORAND uses a drinking cure at Karlsbad simultaneously with compresses of radioactive mud which is found in Franzensbad, and combines this treatment, moreover, with local irradiation by the quartz lamp. The results thus obtained signify an advance as compared with the routine methods. After irradiation has been given for some weeks, the gall bladder region is, in the majority of the cases, no longer painful. During the treatment the patient must be at complete rest (confinement to bed). When ultra-violet irradiation is used only a mild erythema should be obtained; where mud compresses are contraindicated, more intense irradiations are permissible, in order to obtain stronger erythmata. It has been observed that ultraviolet rays not only act on the area directly treated, but also provoke very favorable systemic effects. After such a combined treatment of from 3 to 4 weeks' duration the gall bladder distress disappears, which indicates recession of inflammation and protection against attacks of colic.

Carcinoma of the Penis Treated by Thermo-Electrocoagulation. Budd C. Corbus, M.D., F.A.C.S.
The American J. of Surgery, New Series, Vol. vi, No. 6, June, 1929.

The solution of the cancer problem lies in the early recognition of the disease and its adequate treatment.

As carcinoma of the penis is often a late sequela of chronic balanitis due to phimosis, early circumcision should be encouraged. However, if there is the slightest evidence of a beginning carcinoma, circumcision should not be performed until many months after the growth has been destroyed by thermo-electrocoagulation.

With an early diagnosis and immediate and proper treatment, the prognosis is excellent. In late diagnosis, even with skillful treatment, the prognosis is fatal.

According to the best authorities under no circumstances should a section of a growth be removed for diagnosis by simple excision unless followed immediately by some form of coagulation. In order to safeguard any metastases it is preferable to remove tissue for biopsy immediately preceding the thermo-electrocoagulation.

The following technique is suggested for those advanced cases of carcinoma of the penis that have heretofore had the organ completely removed by surgical excision. While the method does not offer a cure, it removes the foul fungating mass with a minimum chance of disseminating the metastases that have already occurred, at the same time leaving a part of the penis in a normal condition. If the coagulation is complete, there will be no recurrence in the stump.

For the metastatic growth that has already occurred in the regional glands, either roentgen rays or thermo-electrocoagulation may be employed.

A. A heavy rubber sheet is placed over the thighs, beneath which are placed several layers of gauze moistened with water. On top of the rubber sheeting is placed the inactive electrode. The penis

with a Nelaton catheter that has been passed into the bladder is layed flat on the inactive electrode. With the active button electrode the whole mass is cooked white, taking enough of the healthy tissue to insure complete destruction of the growth.

B. The method of cutting away the coagulated tissue: The margin of the incision should be kept within the coagulated tissue in order to avoid hemorrhage and should not sever the catheter. Unless the coagulation is carried to the point of escharing the catheter will not be destroyed.

C. On the stump of the penis, catheter in situ, the retention sutures should be carried through the skin. The catheter may be removed on the twelfth postoperative day.

Die Schraubenzugbehandlung Der Fingerkontrakturen. (Screw traction treatment of finger contractures.) Josef Wolf.

Monatsschr. f. Unfallheilkde, 1929, Ann. 36, p. 447-451.

For the purpose of mobilizing a joint ankylosed by virtue of changes of the soft parts, the "brise-ment force" performed under local or general anaesthesia, or the twisting procedure inaugurated by MOMMSEN in orthopedics, can be applied. MOMMSEN's procedure has stood the test best in the treatment of finger contractures. A CRAMER wire splint bent into a bow is applied to the hand and fastened in a forearm and hand cast of plaster of Paris. The fingers are then introduced into loops, doubled strings are drawn from the loops to the CRAMER splint and interlaced with one another by means of little wooden rods passed through it and shortened. Traction at the fingers is thereby obtained in the position of extension. To undertake this procedure in out-patients, the author recommends replacement of this somewhat primitive twisting method by the screw traction procedure. A guide splint for the male screw being fastened in a plaster-of-Paris glove and the screw traction applied. On the male screw the progress of treatment can be ascertained by millimeters; the equipment is besides more handy so that the patient can easily slip on the sleeves with it. Eventually an apparatus for traction regulated by a male screw can be made of celluloid so as to perform the curative procedure by stages, if necessary, or secure the obtained result by wearing such an apparatus at night for some time after the termination of the treatment.

Die Roentgentherapie Der Tuberkulose Der Zunge. (Roentgen ray therapy of tuberculosis of the tongue.) A. Eghiayan.

Schweiz. med. Wochenschr., 1929, Ann. 59, p. 463-464.

Roentgen ray therapy produces almost immediate relief from pain, and a relatively rapid and lasting cure both of the nodular and ulcerous types. Moreover the roentgen ray therapy has the advantage of being bloodless, painless and non-mutilating method of treatment. The author has observed the following technique:

Weekly roentgen ray irradiations starting from

the tip of the tongue, single doses of 100 French R, filtration by 4 mm. Al, small localisator of lead glass 4 cm. in diameter, focal distance 25 cm., KLINGELFUSS inductor apparatus, COOLIDGE tube, spark gap 39 cm., amperage 3 ma. Six exposures altogether, each lasting for two minutes.

The Biological Action of Secondary Beta Radiation from Buried Needles or Tubes Containing Radium.

The Brit. J. Radiol., Vol. III, No. 26, Feb., 1930.

The difference between the incident secondary beta radiation from platinum and mica when radiated with gamma radiation from radium was detected biologically by effects upon the growth of Jensen's rat sarcoma after *in vitro* radiation. A similar difference was detected photographically.

With regard to emergent secondary beta radiation it was concluded that when radium is heavily screened with heavy metals there is no advantage in using paper to cut off the secondary beta radiation, and that when platinum needles or tubes containing radium are buried in living tissues, secondary beta radiation will play a part in the effects obtained.

The radium made use of in these experiments was on loan from the Medical Research Council.

Mechanotherapy in Diseases of Heart and Vessels. Fr. Kirchberg.

Fortschritte d. Therapie, 1929, Ann. 5, Nr. 20, (Oct.), p. 663-668.

Vascular difficulties subsequent to diseases of the heart are almost exclusively due to mechanical factors. Hence the attempt to diminish these difficulties by mechanical measures are legitimate. As long as there has not arisen severe systemic phenomena or irreparable processes, much can be achieved by systemic mechanotherapy, i.e., by massage, passive gymnastics, active and resistance gymnastics, training and sport.

The effect of massage effects the work of both halves of the heart. The work of the left ventricle is rendered easier by the dilatation of the capillaries in the musculature and subcutaneous connective tissue. A correctly performed massage is the ideal way to obtain it. The regulation of the work of the right heart consists in the improvement of the venous blood stream by massage, which effect is due on the one hand, to direct squeezing out, and on the other hand, to the fact that the management of the muscles in itself, owing to the intimate connection of the muscle fasciae with the vessels, renders the circulation substantially easier. Since it is possible to regulate the massage and the passive gymnastics (which ought to be applied here always in recumbent position), they should in all events be resorted to as a method for sparing and exercising the heart. Here the massage of the back is of the utmost importance, for the muscles of the back and the subcutaneous connective tissue are the largest available and therefore most efficient body region. Intense rubbing, effleurage and kneading are the chief measures to be taken into consideration. At

the same time respiration gymnastics are to be added to these measures; the efficient factor being not so much to better supply the organism with oxygen but rather the mechanical improvement of circulation due to breathing as accomplished by the fluctuations of the respiratory pressure which thus strengthens the pulmonic circulation itself. Respiratory gymnastics also aim at keeping the diaphragm mobile. This is obtained by the so-called gymnastics of the abdominal muscles, protruding and retracting the belly in slow rhythm with and without breathing. Patients are to be taught to retract their bellies from the midst and from beneath in order to press their abdominal viscera against the diaphragm, and then to protrude them out to the point of bulging the costal arch. These exercises are first made in lying position, then in erect position and in walking.

In arteriosclerosis, too, a rational mechanotherapy is a valuable adjuvant to medication and bath treatment. This treatment is indispensable in cardiovascular insufficiency, particularly to be found in the middle forties in feeble-muscled individuals with obese tendencies.

Ein Einfaches Mittel Zur Abnahme Von Gipsverbanden. (A simple means for taking off plaster of Paris casts.) Herman Emde and Christ Andreas.

Der Chirurg, 1929, Ann. 1, Nr. 8, (March), p. 258-360.

The authors recommend the following procedure. One liter of a concentrated aqueous solution of barium chloride is prepared according to the following formula:

R. Barium chlorat. crud. 200,0
Tapwater ad 1000,0.

This solution should be kept ready in a quart bottle supplied with a spurting device. For use, the solution is heated by being placed into warm water of from 40 to 60 degrees. In the meantime Billroth batiste is laid under the plaster of Paris cast to be taken off. The latter is covered in the line where one intends to slacken the plaster-of-Paris cast with several layers of a gauze bandage about 4 cm. in width, which is saturated with the heated barium chloride solution, and pressed down on the plaster at the same time. After about 10 minutes the bandage is taken off, and the knife then easily penetrates into the depth. Should the cast fail to soften throughout its depth, barium chloride is again poured into the cut area. The softening of the cast is due to neutral chemical reaction. The chemical reaction between barium chloride and plaster-of-Paris produces no acids, bases nor otherwise chemically corrosive substances. The reaction products, calcium chloride and barium sulphate, are indifferent. An excess of barium chloride is quite harmless for intact skin, as it does not possess any corrosive properties. In particular cases, however, care must be taken against it entering the circulation. Open wounds (compound fractures with fenestrated plaster-of-Paris casts, etc.), must, therefore, be protected by gauze and Billroth batiste before softening.

Sunlight Type S-1 Lamp (G. E.) Therapy in Human Rickets and Rachitic Spasmophilia.
Henry J. Gerstenberger and G. Richard Russell.

J. A. M. A., Vol. 94, No. 14, Pp. 1049, April 5, 1930.

To establish the efficacy of the Sunlight Type S-1 Lamp of the General Electric Company, as a source of the antirachitic factor, observations were made similar to that followed in a previous study with the quartz lamp. The following conclusions were made: Observations made on three rachitic infants showed that weekly erythema-producing exposures of both the front and the back body surfaces to the rays produced by the Sunlight Type S-1 G. E. Lamp brought about healing in the roentgenograms and in the blood within the same time established by the authors previously for similar weekly exposures of rachitic infants to the quartz lamp.

This lamp is a combination incandescent tungsten-mercury arc housed in a glass bulb which is permeable to ultraviolet rays of a wavelength of 2,800 angstrom units.

Ueber Die Wirkung Der Grenzstrahlen Auf Die Haut. (On the effect of borderline rays on the skin.) K. Herzheimer and E. Uhlmann.

Arch. f. Dermatol. u. Syph., 1929, Bd. 157, Nr. 3, (May), p. 467-482.

Histological examinations performed on a series of patients treated with borderline rays, demonstrated the effect to be limited to the epidermis, and missing in the cutis. The changes occurred following small ray doses which nevertheless completely sufficed to produce therapeutic effects. In the end, the smaller dosage, by routine radiation, reach the deeper layers of the skin. In this manner one can determine the practical boundaries of the application of this kind of ray. They are indicated for all

epidermic processes and all dermatoses in which changes of epidermis prevail. For deeper structures they are irrational and superfluous, as there is a better remedy at our disposal in the routine roentgen ray therapy. The authors operated with Dermi-equipment, MUELLER soft ray tube, 10 MA and 9 KV max. at a focal distance of 12-15 cm., 12-15 minutes. The transgression of a definite minimum dose of borderline rays elicited phenomena macroscopically quite like the sequelae seen after hyperdosage of x-rays; the therapeutic use should therefore always keep below the skin unit dose. It can be said in general, that the histologic finding shows a picture which on the one hand closely approaches the phenomena due to the effect of ultraviolet rays, and on the other hand agrees with the effect of roentgen rays in many particulars.

Zur Behandlung Von Hornhauterkrankungen Mit Ultraviolett Licht. (Treatment of disease of the cornea by ultraviolet light.) H. Gasteiger.

Klin. Monatsblätter f. Augenhkde, 1929, Ann. 82, (March), p. 344-350.

The author has irradiated 75 cases of ulcer serpens with the quartz lamp of BIRCH-HIRSCHFELD. Technique: sensitization with fluorescein or Bengal rose, irradiation twice a day for from 5 to 6 minutes. If necessary, anaesthesia was previously given. It proved, however, often unnecessary. He obtained very good results by this procedure. Of 75 irradiated eyes 69 could preserve their sight. In all cases the pathogenic germs could be evidenced (chiefly pneumococci). Irradiation was also given in slighter ulcers of the cornea, the so-called marginal ulcers of cornea and in some cases of phlyctenular ulcer, as well as in corneal herpes, with good results in most cases. The method failed, however, in deeper seated processes (interstitial keratitis, keratitis profunda), which is not surprising in consideration of the nature of the disease.



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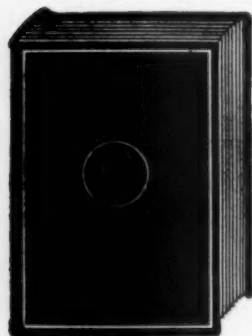
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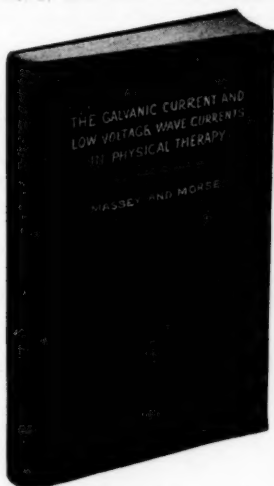
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